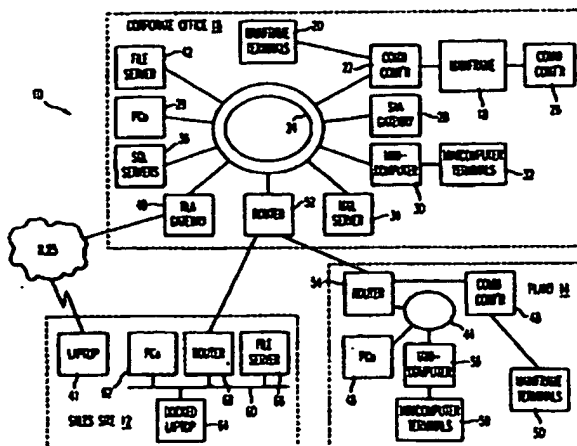




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(54) Title: CUSTOM PRODUCT ESTIMATING AND ORDER PROCESSING SYSTEM



(57) Abstract

A system and method for generating specifications, estimates and orders for the manufacture of custom items such as business forms is provided which stores estimate data at a central location, e.g., a corporate office (10), for access by sales representatives at remote sales sites (12). A sales representative creates an item specification for a form to be manufactured and electronically transmits it to the corporate office to obtain estimate data. Data relating to the cost and list price to produce the form based on the item specification is transmitted to the sales representative. The sales representative determines a sell price from the pricing data, and generates a production order using the item specification and the estimate data, among other data. The production order is transmitted to a manufacturing plant (14) for job execution. The system manages a centralized repository of item specification, estimate and customer contract data, among other types of data, for analysis and reporting which can be accessed by computers at the corporate office(s) and different manufacturing plants and sales sites.

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CUSTOM PRODUCT ESTIMATING AND ORDER PROCESSING SYSTEM

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15 This application is a continuation-in-part of U.S. Patent Application Serial No. 08/298,274, filed August 31, 1994, which is a continuation-in-part of U.S. Patent Application Serial No. 08/295,385, filed August 24, 1994. The entire subject matter of both of these patent
20 applications is hereby incorporated herein by reference for all purposes.

Field of the Invention

25 The invention relates to a computer-based system and method for estimating and ordering the custom manufacture of an item such as a business form.

Background of the Invention

Most businesses and other types of organizations rely on a large variety of consumable products such as forms, labels, diskettes, computer paper and computer supplies to collect, store and distribute important information. These organizations can benefit from a comprehensive management system for these information-processing products which can include on-screen form and label design, database management, inventory management, and automated entry of orders and other types of data.

Manufacturers of business information products such as forms and labels generally employ a number of sales representatives located both at the corporate office(s) and offices remotely located therefrom. The sales representatives interact with customers, that is, businesses requiring office supplies such as forms and other products for recording and distributing business-related data, to determine the format and content of a form, label or other product which best suits the customers' data collection and management needs. Following form design, the sales representative generates an order to specify the number of forms to be printed, form size, paper quality, ink color, print type, number of plies, requested shipping dates, and fastener type, among other information. Order generation is typically a manual process for the sales representative. Thus, the customer interaction process can be arduous and time-consuming because of the multitude of options that are considered when designing and ordering a form.

After a detailed order is created, a sales representative typically forwards the order electronically or by regular mail to a plant. If the order is large, it can be processed at the manufacturer's corporate office to select, from among a number of manufacturing plants co-

located with or remotely located from the corporate office, the best equipped plant to fulfill the order. The order is then forwarded to the selected plant, which manufactures and ships the product in accordance with the specifications in the order. The corporate office generally also performs accounting functions to bill the customer for the manufactured products.

The manner in which an order is generated and processed can vary depending on the business forms manufacturing system. In some systems, the form design and ordering process is done manually by a sales representative, that is, the content of the form and the order are written by the sales representative or customer on paper or electronic forms designed for these processes. The sales representative typically determines the sale price based on data in a pricing manual or available in the memory of a computer. After the representative enters the sell price onto the ordering form, the representative submits the form and the completed order to the manufacturer's order receiving office by facsimile or mail.

Another type of business forms manufacturing system automates the design and ordering of forms by the remotely located customer or sales representative. The system is organized in essentially the same manner described above. It comprises a manufacturer's computer at a central corporate office which communicates with several remote customers' or sales representatives' personal computers (PCs), and computers at the production facilities or plants. The form is designed on a remote PC using a form design software program. The form parameters are automatically transferred to a second software program for ordering, which permits a user to enter additional parameters such as order quantity and delivery information. The PC proceeds to complete the order by automatically

calculating price in accordance with the entered parameters and the ordering software. The form and the completed order are subsequently simultaneously transmitted in machine format (i.e., electronically or on disk by mail) to the manufacturer's computer, which confirms the order and determines the best printing facility or plant. The order and form are finally transferred electronically to the selected printing facility.

To compete with other manufacturers of paper and electronic business forms, manufacturers seek to improve their form design and ordering systems and therefore their sales transactions with customers by improving the accuracy of cost and/or list price calculations, and reducing the paperwork and the time spent by sales representatives when performing price estimation and order entry. As explained above, one way manufacturers seek to improve their ordering systems is to automate the ordering process by including automatic price calculations at the sales representative's remote computer. These price estimates, however, are problematic because the sales representatives' computers may not be equipped with the most recent pricing data. Pricing data changes frequently due to a variety of factors such as variable material and labor costs. These changes need to be downloaded regularly to the sales site computers. This can result in inconsistencies in the price estimates calculated by different sales representatives.

For the above reason, among others, predominantly centralized storage of pricing information and consultation between a remote sales site and the manufacturer's corporate office during cost estimation is advantageous. The centralized storage of information also allows for flexibility in pricing to reflect, for example, pricing agreements between certain customers and the manufacturer. Further, the stored pricing data can be continuously

updated with data received from different sources, such as manufacturing plants, which can monitor and report actual job and material costs to the manufacturer. Consultation with the corporate office for centralized storage of cost data eliminates the problem of having to continuously update the data at the sales representative's site in order to keep all representatives apprised of the same pricing information.

While it is possible for the remote computer to access the central database information in order to perform the estimate calculation itself, it is more advantageous for estimate calculation to be performed at the headquarters and then forwarded to the sales site because pricing data and algorithms can be proprietary and, therefore, are best kept for security reasons at a central location for security reasons. Further, centralized storage of price data preserves the integrity of data better than if it were distributed to each of the remote sales computers. Accordingly, a centralized storage system for price data requiring consultation between the different sales representatives and the corporate office system promotes more consistent estimates from the sales representatives.

A disadvantage to calculating price entirely at the sales site, that is, without requiring the exchange of any pricing data with the corporate office during the estimation process, is the lack of corporate office control over the list price offered by the sales representative to the customer. Such control may be desirable for a number of reasons. For example, simple forms such as one-sided, single-ply, carbonless forms can be priced in a relatively straightforward manner at the sales site, provided the material and form feature cost tables consulted by most forms manufacturers for pricing are updated. The equipment set-up time, run speeds and labor required for these types

of manufacturing jobs are generally known and factored into the tables. Complicated forms (e.g., multi-ply forms with carbon papers and various perforations and fasteners or hole punching requirements) that are priced using these tables, however, are more likely to be underpriced because slower equipment run speeds, longer set-up times and other factors were not taken into consideration when generating the tables. These other factors can include, for example, the ability of different plants to perform the desired manufacturing processes, and customer and/or manufacturer item-specific contract data. By involving the corporate office in the estimation process, these factors can be taken into account when appropriate. Even when complex forms are not involved, the corporation may simply wish to have corporate office personnel review a sales representative's estimate, for example, because a proposed job exceeds a certain sell price, or involves a new or highly valued customer. Further, previous estimates that are stored at the corporate office can be used for operations and sales administration purposes. For example, previous estimates can be analyzed to locate which potential customers have been approached by a sales representative, to perform analysis such as determining how many estimates mature into product orders, and to determine which sales representatives deserve rewards for their successful endeavors or require additional training and incentives to improve their performance.

Another disadvantage to a number of existing business form manufacturing systems is that a sales representative is required to enter certain information twice, that is, once to specify an item to be manufactured and to get an estimate, and a second time to place an order.

Summary of the Invention

5 The order processing system of the present invention
overcomes many of the limitations of known business form
manufacturing systems, while also realizing a number of
advantages over such systems. In accordance with one
aspect of the invention, a sales site computer is
programmed to facilitate the entry of design parameters for
creating a form and estimate parameters to obtain estimate
data from a manufacturer's corporate office, and to store
10 these parameters for later use in a production order.
Computers at the sales site, plant and corporate office
locations are networked and are programmed in a manner
which maximizes the integration of different software
systems and therefore the ability to share data (e.g.,
15 parameters relating to an item specification, and data
relating to the customer) between the various components of
the system of the present invention. The amount of
information the sales representative or customer re-enters
during the creation of a production order is therefore
20 minimized. Further, specifications for an item order are
captured in a memory device and can be used for repeat
orders.

In accordance with another aspect of the present
invention, a computer and a database are provided at the
25 manufacturer's corporate office for storing standard cost
tables and calculating cost and/or list price estimates
based on the tables and the item specifications and
estimate parameters, which were entered by a sales
representative or customer at a remote sales site and
30 transmitted, preferably electronically, to the corporate
office.

In accordance with still another aspect of the present
invention, custom price matrices are created to generate
customer-specific estimates in accordance with a contract

agreement between the manufacturer and the customer.

Further, the corporate office computer and database are configured to manage contract information by maintaining contract parameters on-line, and monitoring contract performance and compliance using system analysis and reporting.

Brief Description of the Drawings

These and other features and advantages of the present invention will be more readily apprehended from the following detailed description when read in connection with the appended drawings, in which:

Fig. 1 is a schematic block diagram depicting corporate office, sales and plant hardware subsystems in a product specification, estimating and order processing system constructed in accordance with an embodiment of the present invention;

Fig. 2 is a functional block diagram depicting software subsystems associated with the corporate office, sales site and plant depicted in Fig. 1;

Fig. 3 depicts a computer monitor screen generated by the sales information network software employed at the sales site of Fig. 1;

Fig. 4 is a flow chart illustrating the process of creating an item specification, obtaining an estimate, converting the item specification into a production order, and forwarding the order to a plant in accordance with the present invention;

Figs. 5 through 31 depict computer monitor screens which are generated to prompt a sales representative or other user to enter item specification information;

Figs. 32 and 33 depict computer monitor screens which are generated to prompt a sales representative or other user to enter information to obtain an estimate;

Fig. 34 depicts a computer monitor screen which is generated to provide a sales representative or other user with estimate data;

5 Fig. 35 depicts a computer monitor screen which is generated to prompt a sales representative or other user to calculate sell price using estimate data;

Figs. 36 through 40 depict computer monitor screens which are generated to prompt a sales representative or other user to enter item usage information;

10 Figs. 41 through 44 depict computer monitor screens which are generated to prompt a sales representative or other user to enter information for generating a production order; and

15 Figs. 45 through 53 depict computer monitor screens for prompting a user to enter information used for the generation of a contract price matrix.

Detailed Description of the Preferred Embodiment

20 Fig. 1 depicts a product or item specification, estimating and order processing system 10 constructed in accordance with the present invention. For illustrative purposes, the system 10 will be described for specifying, estimating and ordering the manufacture of custom business products such as business forms, promotional graphics,
25 labels, mailers and envelopes, as well as commercial printing on paper, containers and other surfaces. It is to be understood, however, that the system 10 can be used to specify, estimate and order the manufacture of other types of items. The order processing system 10 comprises one or
30 more sales offices or sites 12 (which may be dedicated offices or simply desk top computers operated by sales representatives at the customers' offices), and one or more manufacturing plants 14, which are both connected to at least one corporate office 16 by communication links as

described below. In general, the sales offices and plants are remote, although they can be co-located with the corporate office. The computer-based systems at the corporate office 16, the sales site 12 and the plant 14 and their interconnecting communication links collectively form a wide area network (WAN).

The corporate office 16 comprises at least one computer for performing a number of processes, and coordinating the activities of other computers located at the corporate office and remote locations (e.g., the sales sites and plants) in performing these processes. The processes include, but are not limited to, tracking inventory at both a corporate storage site and a customer storage site, accounting, purchasing, managing customer contracts, and determining labor and actual material costs to produce orders. For illustrative purposes, the corporate office 16 can comprise an IBM 3090 mainframe computer 18 connected to a number of mainframe computer terminals 20, which communicate with the mainframe computer over dedicated digital lines via a communication controller 22. The communication controller 22 also connects the mainframe computer and the mainframe terminals to a data communications network 24 such as a local area network (LAN). Another communication controller 26 can also be provided to connect leased telephone lines from terminals (not shown) through the mainframe computer to the LAN via a router 52.

A minicomputer 30 and a number of associated minicomputer terminals 32 are connected to the LAN 24 for corporate development purposes. An electronic mail server (e.g., E-mail) 34 supports messaging within the corporate office, as well as with terminals and computers at sales sites and plants. At least one data server 36 is provided to support estimation and order entry applications by

allowing remote computers to access a database of shared data and program files which is maintained at the corporate offices and described in further detail below. A Remote Local Area Network (LAN) Access gateway 40 or RLA gateway is provided to permit X.25 communication protocol dial-up connections between sales representatives conducting business outside of a sales office (e.g., on a desk top computer) and the LAN 24. Other communication links and protocols (e.g., a dial-up frame relay, and ISDN), however, can be supported via the router 52.

The plants 14 are each preferably provided with a LAN 44, as shown in Fig. 1, to support users working on a number of PCs 46 to provide data to the corporate office data server or database 36, as well as to send messages via the electronic mail server 34. Other processes performed at a plant can include, but are not limited to, managing raw material inventory, scheduling and tracking jobs, shop floor data collection, production reporting and job planning, and providing the corporate office with data concerning the planned use of materials, materials requisitions, and the actual consumption of materials and labor during job execution for comparison with the corresponding job estimate. As described in connection with the corporate office, each plant is preferably provided with a communication controller 48 to connect mainframe computer terminals 50 located at plant sites 14 to the mainframe computer 18 at the corporate office 16 over the LAN 24 via routers 52 and 54. A minicomputer 56 such as the IBM minicomputer AS/400 and associated AS/400 terminals 58 are connected to the LAN 44.

As shown in Fig. 1, the sales offices each preferably comprise a LAN 60 to interconnect a number of PCs 62 and/or docked laptop or portable computers 64. A file server 66 can be connected to the LAN 60 to support shared data

between multiple PC users. A router 68 is connected to the LAN 60 to interconnect the sales office 12 with the corporate office 16 with dial backup capabilities. Sales representatives can also access the corporate office 16 using, for example, their portable computers via the RLA 40 gateway or the router 52.

The system hardware architecture described in connection with Fig. 1 facilitates maintenance of remote systems such as the sales office and plant subsystems, and the distribution of software to these subsystems by allowing for the sharing of data between the platforms e.g., of the mainframe computer 18, the minicomputers 30 and 56 and the personal computers 29, 41, 46 and 62. In addition to messaging, the corporate office LAN 24 supports a number of applications, which can also be supported by the LANs at the sales office and plant sites, such as word processing, data analysis, ad-hoc reporting, among other office administrative functions. Further, the networking of the PCs at the sales offices and plants facilitates order estimation and entry, as well as the electronic transmission, of production orders and copy folder information to the plants from the corporate office LAN. Copy folder information generally includes specifications for manufacturing, packaging and shipping, and form usage data such as the type of printer to be used. While forms usage information is not necessary for an estimate, it is useful for plant quality control. In accordance with one embodiment, the sales offices send orders to the plants via the WAN. The WAN also allows a form design to be transmitted directly to a plant for pre-processing.

In connection with the present embodiment, printing at a plant 14 is intended to encompass any and all processes and/or the use of any type of machines or other equipment which can be employed for or utilized when preparing or

producing imaging on a substrate that is to be read by machine or a human being, including, but not limited to, letter press, intaglio, gravure, lithographic, electrophotographic, xerographic, electrostatic, magnetic, flexographic, ink jet, laser, thermographic and offset lithographic printing processes. It will be appreciated by those skilled in the art that the present invention is not limited to a particular type of computer, data storage device or communications hardware such as the above-described components. Further, the hardware, and the transmission paths and networks can vary depending on a variety of factors such as the number of users accessing the system and the desired data transmission speed. For the purposes of this invention, electronic transmission of data such as a business form image can include, but is not limited to, transmission via modem, facsimile and electronic data interchange (EDI), among other data transmission techniques. The corporate office, sales site and plant personal computers preferably operate in accordance with Microsoft WINDOWS™, although other similar windowing environment and application user interfaces can be used.

The software associated with the corporate office 16, the plant 14 and the sales site 12 will now be described in connection with Fig. 2. The corporate office computer subsystems depicted in Fig. 2 comprise an Order Entry and Inventory subsystem 88 which receives release orders from a sales representative computer (e.g., computer 62), as well as from mainframe terminals located at plants and other order entry offices. Release orders are generated by sales representatives to order the release of finished goods inventory stored at any corporate storage facility through electronic ordering. This inventory includes, for example, forms that have already been produced for the

customer and are warehoused at a plant or distribution facility in accordance with a warehousing agreement, and ready-made office supplies such as staplers and telephone message pads. A release order from the Order Entry and Inventory subsystem 88 or from the sales site via the Sales Information Network 86 is sent to a Distribution subsystem 80. The Distribution subsystem 80 generally operates in a warehouse remotely located from the corporate office 16. The Distribution subsystem determines where to store goods within the warehouse, retrieves and ships goods in accordance with release orders, and transmits data to the Order Entry and Inventory subsystem 88 for invoicing.

A sales representative can also generate production orders for the manufacture of a custom item such as a business form designed only for use by a particular customer. The generation of a production order for a custom item generally involves the transmission of item specifications for a production order to an Estimating subsystem 90. The Estimating subsystem 90 is used to generate estimate data using at least one of a number of methods described below. The estimate data is transmitted from the Estimating subsystem 90 to the sales site 12. The estimate data can be used in conjunction with other data such as the data in a copy folder to generate a production order which is sent to a plant.

With continued reference to Fig. 2, the corporate office comprises a Contract Management subsystem 92 for storing customer-specific contract terms and conditions in order to resolve inquiries regarding this information made by sales representatives and customers, and to determine the degree to which customers have complied with their contracts, among other uses. The contract data can include a customer/item relationship comprising contract pricing information for customer contract items.

The corporate office 16 further comprises a Labor and Material subsystem 94, a General Ledger subsystem 96, an Accounts Payable subsystem 98, a Purchasing subsystem 84 and an Advanced Shipping Notice (ASN) Data Feed module 82. The ASN module 82 interfaces with the Purchasing subsystem 84, which in turn transmits data to the various plants comprising paper roll identification numbers.

As will be described below in connection with the Manufacturing Information Processing System (MIPS), a Raw Material Inventory Control subsystem 104 and a Data Collection subsystem 108 monitor the materials used in the plants for fulfilling customer orders. The plant 14 provides data from the Data Collection subsystem 108 to the Labor and Material subsystem 94 and to the Estimating subsystem 90 relating to the materials and equipment used, as well as the labor required, to fulfill a particular order. The data from the Data Collection subsystem 108 is used for performing actual cost analysis at the corporate office 16, for job planning at the plant 14 and, once the actual materials used to complete an order have been determined, for updating a Planning Bill of Materials subsystem 102 and the Raw Material Inventory Control subsystem 104. The plant 14 can therefore provide data to a sales site regarding the status of an order for improved customer service. Further, the Purchasing subsystem 84 and the Raw Material Inventory Control subsystem 104 or the Labor and Material subsystem 94 provides the Estimating subsystem 90 with information concerning material attributes such as weight, paper grade, paper or ink color, material codes and material quote information (e.g., quote number, effective date, and material price) and therefore facilitates the process of determining more accurate estimates for the cost of fulfilling a customer order. Similarly, the Labor and Material subsystem 94 provides the

Estimating subsystem 90 with standard material cost information, actual job information received from the Job Scheduling and Tracking subsystem 100 in the various plants, as well as actual production information such as waste percentages, feet per run hour and actual material usage.

Information from the plant is also used by the General Ledger subsystem 96 to generate accounting journal entries. As stated previously, the Raw Material Inventory Control subsystem 104 and the Data Collection subsystem 108 monitor the materials used in the plants for fulfilling customer orders. The Purchasing subsystem 84 receives requisitions from the Raw Material Inventory Control subsystem 104. When the material receipt is received, it is used to update the Raw Material Inventory Control subsystem via the Receiving System 106. This information is provided to an Accounts Payable subsystem 98 for automatically tracking the accounts payable to the various vendors of these supplies. The Accounts Payable data is also provided to the General Ledger subsystem 96.

MIPS 89 is used by a manufacturing plant 14 to manage jobs for cost efficiency and can, for example, be stored in the memory of the plant minicomputer 56. MIPS comprises a plurality of software subsystems which are shown in Fig. 2. The Planning Bill of Materials subsystem 102 determines the materials, shop equipment, and processing time required to fulfill an order based on item specifications in a production order. An advantage of the system 10 of the present invention is that the item specifications are stored in a memory device after they are transmitted to and received at a plant and therefore do not have to be re-entered in the plant or the corporate office computer systems. The Job Scheduling and Tracking subsystem 100 can schedule the completion of jobs in a manner which improves

plant efficiency. For example, the MIPS 89 can schedule several jobs for different customers to be processed at the same time because the jobs require the same color ink or the same number of plies. The Shop Floor Control subsystem 110 monitors where a product is located at a given point in time during the plant manufacturing process and provides this data to the Job Scheduling and Tracking subsystem 100.

MIPS 89 further comprises a Raw Materials Inventory Control subsystem 104 for monitoring supplies (e.g., paper, ink), and informing the Purchasing subsystem 84 when raw materials are needed. A Receiving subsystem 106 monitors the receipt of raw materials for custom product manufacturing, as well as receipt of finished goods, e.g., release order forms that have already been produced and are being warehoused, and office supplies such as staplers that are offered for resale in a catalogue along with the release forms. A Data Collection subsystem 108 collects data relating to materials and labor used per job, per customer and per plant. This data can be used for internally monitoring the performance of the plant. This data can also be used by the Labor and Materials subsystem 94 for cost accounting.

The subsystems of the sales representative system or Sales Information Network (SIN) 86 will now be described in connection with Fig. 3. The SIN software is preferably stored in the memory of the personal computers 41, 62 and 64 used by the sales representatives. SIN software can also be provided on terminals for use by customers. Fig. 3 depicts a screen which is generated on a sales representative's computer monitor, for example, in accordance with the SIN software and a WINDOWS™ or equivalent software application. The user can access a subsystem by selecting the corresponding button or menu option on the screen using a mouse, a key pad, a touch

screen or other input device. After a button is selected, the computer initiates execution of a program for generating additional screens. A number of these screens (e.g., screens depicted in Figs. 5 through 44) are described with reference to Fig. 4.

With reference to Fig. 3, the sales representative can begin entering item specifications for producing, for example, a custom business form by selecting the button 115 corresponding to a Custom Order subsystem. The computer in turn generates the screen depicted in Fig. 5, that is, a Login screen which requests a login name to begin the process of entering a form specification, as described below. This specification is used in conjunction with data at the corporate office to generate an estimate for manufacturing the form. Item specifications entered using the Customer Order subsystem generally do not need to be as comprehensive as completed item specifications used for generating production orders. The information needed to obtain estimate data is typically less than that required to instruct a plant on how to manufacture a custom item.

The computer 62, 64 or 41 can generate estimating screens (e.g., Figs. 32 through 35) following the item specification screens (e.g., Figs. 5 through 31). Alternatively, the sales representative can retrieve a previously-stored item specification and/or estimate. Item specifications can be retrieved from memory by entering an item number in the "Search" screen depicted in Fig. 8, for example, or selecting the button 124 (Fig. 3) to access a Forms Management subsystem. If the customer finds the estimate to be agreeable, the sales representative can invoke the Custom Order subsystem via button 115 (Fig. 3) to begin entering additional information that is useful to generate a production order such as shipping information

(e.g., see Figs. 41 through 44). The production order is then preferably electronically transmitted to a plant.

The remaining buttons on the screen depicted in Fig. 3, that is, buttons 114, 116, 118, 120 and 126 are activated to enter queries, generate reports and perform a number of inventory management functions available in the SIN 86. The screens generated in response to activating the Custom Order button 115 each include a button, drop-down menu or tool bar option (e.g., "File") that can be selected to return from the specification, estimating and order screens (e.g., the screens in Figs. 5 through 28) to the screen in Fig. 3 in a conventional manner. Upon activation of the button 114, a Release Order Processing subsystem permits a sales representative to enter release orders to order the release of inventory stored at any corporate storage facility, preferably via electronic data interchange (EDI) ordering. The EDI orders can be electronically transmitted throughout the WAN and ultimately to a plant or distribution facility 12, which is preferably the facility that is located closest to the destination point of the ordered goods. This reduces freight cost for the customers, as well as expedites delivery. The sales representative can create a new release order or open a file to an existing release order by highlighting the proper menu option on a main release order screen (not shown) and striking the enter button on the key pad or clicking a mouse. In addition to creating new release orders, editing existing release orders, and saving and printing release orders, the sales representative can transmit release orders to the Order Entry and Inventory subsystem 88 at the corporate office, as well as receive release order acknowledgments. To save time, information that is frequently used by a customer to order the release of goods from inventory can be entered

into a template. For example, information from the corporate office (e.g., from the data server 36) relating to a customers ship-to and sold-to addresses can be entered once into a template for subsequent uses, eliminating the need to enter these addresses at a later time. Thus, the template-based system improves accuracy and speed.

Button 116 (Fig. 3) is used to invoke the Order Inquiry subsystem, which permits a representative to access information electronically regarding the status of a release or production order. A query function is provided to allow the sales representative to find any order by searching the database for such references as user location, production order number, item number, or other criteria that the representative defines in a previously placed order. When a particular order is found in the database, an order status code is presented by the computer 41, 62 or 64 in accordance with the subsystem to inform the representative if all items in an order were shipped or, in the case of a release order, if a back-order was required. Additional information regarding release orders is provided to inform the representative of the originating warehouse location, the shipping date, the shipping carrier, as well as coding for orders supplied from more than one warehouse. Data from the different plants is provided to the Order Entry and Inventory subsystem 88, which can be used to track the completion of a production order as explained above in connection with Fig. 2.

Button 118 (Fig. 3) is used to select the Customer Inventory subsystem, which allows either the customer or the sales representative to track inventory at the customer location. Two methods are provided for tracking inventory. The first method employs inventory counts, that is, counting receipt, on-order, and ending inventory amounts and entering them into the system at the end of the month.

The second method employs bar codes for perpetual inventory monitoring, that is, scanning bar codes on inventory items indicating receipt, on-order, usage and transfer transactions on a daily basis or as they occur. This subsystem offers the customer valuable information to prevent stock-out situations, as well as useful trend usage analysis. If the inventory database is kept up-to-date, the customer inventory subsystem can offer additional benefits such as ad-hoc query creation and reports, which helps users to track inventory and overall usage of their products.

As stated previously, button 124 (Fig. 3) is used to select the Forms Management subsystem, which allows either the customer or the sales representative to maintain items such as forms and labels and their associated specifications electronically. The subsystem is generally an electronic database of item specifications and copy folder information. The sales representative or customer can create a form, as explained in further detail below, or scan an existing form into the SIN 86, and then match the on-screen image of the newly created or scanned document to a computer file. The sales representative or customer can subsequently organize, sort and manipulate the specification and corresponding copy folder information that defines every form and label within the database electronically. An exemplary item or form specification sheet is shown in Appendix A. The specification sheet comprises an area for general information such as customer number and product type, an area for usage information such as storage terms and numbering, an area for construction information such as the number of plies, the paper weight, width and color and grade, an area for fastening information such as location and the type of fastener, as well as for the color of inks used on the form.

A menu option within the Forms Management subsystem permits a representative to create an on-screen form using a form design software such as the Perform Pro Plus Forms design software developed by Delrina Technology, Inc. of Canada. Thus, a sales representative or customer has the convenience of on-site laser proofs of newly created forms and therefore fast response to user requests. The Forms Management subsystem permits a customer or sales representative to eliminate and consolidate forms, reduce procurement costs and build a foundation for forms automation. For example, a number of fields within the forms specification sheet or within the forms design itself can be stored as a template and used in later specification sheets, forms and labels, thereby reducing the need to re-enter data.

The information in the Forms Management subsystem can be integrated with the information of other subsystems to essentially instantaneously determine inventory values, usage trends and to generate custom reports. The Sales Information Network (SIN) 86 comprises a Report Writer subsystem corresponding to button 126 (Fig. 3) which allows for the generation of custom reports using the query tool to access data residing in any of the six subsystems. For example, reports can combine ordering, shipment trend and specification information. Each of the subsystems is designed with an open systems architecture so that each subsystem can work in conjunction with the a query tool and the Custom Report subsystem, as well as with the corporate office information systems (Fig. 2). The information within the network can be exported to other WINDOWSTM compatible programs.

The data stored at the corporate office 16, the plant 14, and the sales site 12 (Fig. 1) will now be described. In accordance with an embodiment of the present invention,

the data server 36 at the corporate office 16 maintains the following types of data in the database: item specifications (e.g., for production orders that have been submitted or for estimates that have been generated and require review by corporate office personnel); cost data for generating an estimate; contract data; production orders or order-specific information shared between sales sites and plant; and estimate information (i.e., information that is not contained in an item specification, such as the number of printings requested and storage information). The file server(s) can be configured using, for example, a PC file server, a minicomputer or a mainframe computer. Further, other types of memory devices can be used. Finally, the data server 36 is preferably provided with information that can be downloaded to sales sites or plants through, for example, batch processes. This downloadable information can include, but is not limited to, order status, inventory information and validation data.

A computer (e.g., a personal computer 29) at the corporate office 16 is programmed to operate as or in conjunction with the data server 36 to do the following types of information processing: maintaining cost data and material quotes; reviewing and maintaining estimate matrices; maintaining estimates and item specifications; validating estimates and specification sheets; manipulating and transmitting estimate cost and list price information to sales representatives; producing order entries and maintaining them; conducting profitability analysis, as well as other types of analyses; re-routing production orders on an exception basis; and messaging.

The memory storage device(s) at the sales office 12 (e.g., the file server 66 and the laptop computer 41) preferably store information that is needed only at the local levels such as user information and modem numbers, as

well as information that is generated at the local level such as item specification information. The item specification can be for both items that have and have not been transmitted to the data server 36 at the corporate office 16. These sales site memory device(s) can also contain information that has been downloaded from the corporate office data server 36. As will be described in further detail below in connection with Fig. 4, the sales office computers (whether located at a customer site or corporate sales site) are programmed to generate release orders, to generate and transmit item specifications and requests for estimates, to receive estimate data and convert estimates into production orders, to generate and transmit production orders and to perform messaging.

Item specifications, estimates and orders are preferably maintained at the corporate office, as opposed to the sales sites. A sales representative can access the data server 36 to retrieve an existing item specification and corresponding estimates for different quantities and prices of the manufactured item, and to store the data at least temporarily in a local memory, e.g., the file server 66 or in the memory of a laptop computer. When the sales representative is no longer working with the data, the data is transmitted to the corporate office for updating existing records or creating new records in the database. The predominantly centralized storage of item specification, estimate and order data is advantageous for the reasons stated above, that is, sales representatives have access to essentially the same data for consistent price quotations. It is also easier to back up data at the corporate office than at each of several distributed sites. The integrity and security of the corporate office data is therefore greater than if the data were stored among several sites without any centralized storage. The

corporate office can receive data from several sources (e.g., SIN and MIPS). The estimate data received at each sales representatives' computer can reflect contractual agreements between the manufacturer and a customer. Further, customer data and other data from the corporate office database can be recaptured at the sales representatives' computers to minimize the amount of data that needs to be manually entered when creating an item specification, production order or requesting an estimate.

In accordance with an embodiment of the invention, the sales representative can access customer item data stored at the sales site 12. Item specifications, cost data, order data and other information, however, is preferably stored at the corporate office 16 and not at one or more sales sites 12. This arrangement allows for greater visibility of sales representatives' performance than an arrangement wherein sales representatives have cost data necessary to generate an estimate at the sales site and did not have to consult with personnel or use data stored at the corporate office. As stated above, sales management personnel can use the Report Writer subsystem (i.e., button 126 in Fig. 3) or other system to generate reports indicating estimate and order trends for a particular sales representative using data that is essentially continuously maintained at the corporate office.

In accordance with another embodiment of the invention, the system 10 can be configured to do price-based analysis at the sales sites 12. Price-based estimates generally involve adjusting a list price for a base product in accordance with characteristics and features of a custom item to be manufactured. Cost-based estimates are generally more comprehensive because a manufacturing standard cost (e.g., hours of labor, materials cost and other direct manufacturing costs) is

increased to compensate for administrative and sales expenses, as well as contingencies and margins. Sales representatives, for example, can generate price-based estimates for items that are valued under a predetermined amount using data obtained from the corporate office data server 36, but without having to consult with personnel at the corporate office. The sales representatives can be required to send item specifications for custom items valued over the predetermined amount to personnel at an Estimating department at the corporate office for review and to obtain estimate data therefrom using, for example, cost-based analysis.

Each plant 14 can use, for example, a minicomputer 56 to store data that is generally only needed by the plant. A significant amount of this data is generated locally, and some data is transmitted to the plant by a sales site or the corporate office. For example, actual job and production data is generated at the plant and sent to the Labor and Material and Estimating subsystems. Other data at the plant can include, but is not limited to, estimate data, validated item specifications and MIPS planning specifications. Using this data, each plant can maintain productions orders transmitted thereto, validate order specifications, and perform messaging.

One or more messaging servers are provided in the WAN to store and forward messages to sales sites 12, the plants 14 and the corporate office 16. Two kinds of messages can be sent via these message servers: (1) free form messages that are human readable; and (2) program interpretable messages.

The process of generating an item specification for a business form, for example, at a sales site 12, obtaining estimate data from a corporate office 16, and ultimately forwarding a production order for the custom manufacture of

the form to a plant 14 is described in connection with the flow chart depicted in Fig. 4. For illustrative purposes, the following discussion will reference several screens depicted in Figs. 5 through 21 and Figs. 32 through 44. These screens depict specification, estimate request, pricing and product order entry screens for ordering a business form. These screens are a subset of the total number of screens that can be generated by a computer 62, 64 or 41 in the SIN. For example, different screens such as those depicted in Figs. 22 through 31 can be generated for specifying other types of custom products such as Wal-labels, envelopes and labels.

With reference to block 140 in Fig. 4, a sales representative typically determines customer requirements for a product such as a business form during, for example, a meeting with the customer, and begins to enter a new item specification into a PC 62 or other computer, or to modify an existing item specification. As stated previously, the PC 62 generates a Login screen (Fig. 5) which permits a sales representative to enter his or her name. The PC 62 is programmed to generate another screen (Fig. 6) which lists the names of that sales representative's customers. The screen in Fig. 5 can be configured with a password to restrict access to customers' records to certain persons. The sales representative can highlight the name of an existing customer (Fig. 6) and access their files using a mouse or a key pad. An "Account Information" screen (Fig. 7) is generated which contains account number, customer address and other information relating to the account of an existing customer. The sales representative can modify and update this information. If the customer is new, the sales representative can request a blank "Account Information" screen on which to manually enter this information using, for example, the "File" option in the

menu pad 117. If the account information is correct, the sales representative can activate the "Ok" button on the screen in Fig. 7 to view the next screen (Fig. 9). Alternatively, the sales representative can select the "Tools" option from the menu pad 117. The sales representative's computer is programmed in accordance with the SIN software to generate a pop-up menu (not shown) listing various tools such as a search or query function. The screen depicted in Fig. 8 allows a sales representative to search the database or data server 36 for a particular specification, proposal, estimate or order by number, name and other attributes.

If the customer is an existing customer, the "Customer" screen in Fig. 9 lists the names of item specifications for custom products which have been designed and produced to date for that customer. The sales representative can activate the "New" button to commence entering a new item specification, or highlight the name of an existing item specification and retrieve it by activating (e.g., using a mouse or a touch pad) the "Open" button. If the "New" button is activated, the PC 62 generates the screen depicted in Fig. 10. This screen permits the sales representative to select from two types of product categories, that is, custom products and stock products. If the stock product option is selected, the PC 62 generates one or more screens (not shown) for guiding the sales representative to select type and quantity of stock products and order them for delivery to the customer. If the custom product option is selected, the PC 62 generates a "Custom Product Selection" screen, as shown in Fig. 11, which lists a number of product categories, e.g., business forms, mailers and labels. With continued reference to Fig. 9, the "Customer" screen provides the sales representative with a number of options besides

"Specs" for entering item specifications, such as "Estimates", "Proposals", "Orders" and "Reports". These options can be selected by activating the corresponding button using a mouse or other input device.

5 Exemplary screens for guiding the sales representative to create a specification for a custom product such as a business form are shown in Figs. 12 through 31. In accordance with the SIN software, the sales representative's computer (e.g., a PC 62, docked laptop
10 computer 64 or laptop computer 41) initially generates one or more screens entitled "Business Form Base Specification" which prompt the representative to enter the base specifications, that is, the minimum information required to specify the item to be manufactured. As shown in Fig.
15 12, the base specification for a business form comprises stub size, overall width, number of plies and an indication of whether the form will be composed of bond and carbon paper or will be carbonless. These fields are preferably blank until the sales representative enters the requested
20 parameters. The representative's computer can be configured, however, to automatically provide default values for these parameters which appear in the fields. The representative can then enter different values in lieu of these default values if desired. The base
25 specifications for other items such as envelopes, labels and mailers are different than that of a business form. The base specification screens for these items (not shown) are therefore different because they prompt the representative to enter information relating to other
30 parameters. After the representative clicks the "Finish" button on the screen in Fig. 12, the computer generates the screen in Fig. 13, which prompts the representative to enter customer item name, number, and revision number if the item is being altered from an existing specification.

After the sales representative clicks the "Finish" button on the screen depicted in Fig. 13, the computer is programmed to generate the "Specification Summary" screen depicted in Fig. 14. If the sales representative wishes to review and modify other specification parameters relating to, for example, materials used, composition, printing, packing or fastening, the representative can double click that item in the left column of the screen using a mouse. For example, the representative can double click "Material." The computer, in turn, generates the "Material Base Specification" screen depicted in Fig. 15. The data shown in the screen is automatically provided based on the base specification. The representative can change any of these values as needed by highlighting the "Paper" or "Carbon" in the "type" cell 119 for one of the plies. The computer subsequently generates the "Materials: Paper/Carbon" screen depicted in Fig. 16. The sales representative can enter paper properties or click the tab 121 labeled "Carbon" to enter carbon paper properties on the screen depicted in Fig. 17. The screens are provided with "Ok", "Cancel" and "Help" buttons 133, 135 and 137, respectively. The "Ok" button be clicked, for example, to return to the screen in Fig. 14.

With continued reference to Fig. 14, the representative can double click "Composition" in the left column of the screen using a mouse. The computer in turn generates the "Composition Simple" screen depicted in Fig. 18. This screen indicates specifications that can be selected by the sales representative by simply clicking the desired specifications with a mouse, as opposed to entering alphanumeric values with a key pad. If the sales representative wishes to enter more detailed information relating to the composition of the form, he or she can click the tab 123 labeled "Composition Detail". The

computer subsequently generates the "Composition Detail" screen depicted in Fig. 19. The representative can then change data in the grid shown using a mouse and key pad. Similarly, the sales representative can double click "Fastening" in the left column of the screen depicted in Fig. 14. The computer, in turn, generates a simple specification screen for fastening entitled "Fastening", as shown in Fig. 20. The representative can enter type and location of the desired fastener simply by clicking a mouse, for example. The representative can also click the tab 125 labeled "Fastening-Detail" to enter more information relating to fastening into the "Fastening and Pocket Detail" screen (Fig. 21) which is subsequently generated by the computer.

The SIN software provides a hierarchy of screen formats, that is, base specification screens (e.g., the screens in Figs. 15-17), simple specification screens (e.g., the screens in Figs. 18 and 20) and detail specification screens (e.g., the screens in Figs. 19 and 21) to reduce the amount of data a sales representative needs to enter manually when creating a specification for an item which suits the customer's requirements, as well as the number of screens he needs to actually review. For example, it is possible to create a specification for an item such as a business form by reviewing only the base specification screens for that item without having to review the simple and detail specification screens. The representative can, for example, click the icon 127 provided in the tool bar 129 on the "Specification Summary" screen (Fig. 14) for requesting screens to generate an estimate. The representative's computer is programmed in accordance with the SIN software to generate the screens depicted in Figs. 32 through 35 and described below. Alternatively, the sales representative can review only the

base and simple specifications screens without having to review and use any of the detail specification screens for a particular custom item to be manufactured.

5 Figs. 22 through 31 are exemplary screens for entering specifications for other types of items such as labels, envelopes, roll-type products and items requiring perforations, hole punches or electronic printing. As stated above, the item type is selected using the screen depicted in Fig. 11. The computer 62 or 64, or laptop
10 computer 41 is programmed in accordance with the SIN software to generate base specification screens (not shown) corresponding to the type of item selected for manufacturing. The screens indicate the minimum specification data required to generate a specification for requesting an estimate for and ordering manufacture of a
15 product. The representative's computer subsequently generates a screen similar to the "Specification Summary" screen depicted in Fig. 14, but corresponding to the type of item selected in the screen in Fig. 11. For example, if
20 a specification for a label is being generated and the representative double clicks "Materials" in the left column of the "Specification Summary" screen (not shown) for a label, the computer generates the screen depicted in Fig. 22, which is analogous to the screen for a business form depicted in Fig. 15. The representative can double click
25 "Printing" in the "Specification Summary" screen for a label in the same manner he can for a business form (Fig. 14). The computer generates the "Ink Detail" screen depicted in Fig. 23 to prompt the representative to enter information relating to ink color and type for each ply.
30 The label specified in the screen depicted in Fig. 22 has two plies. Accordingly, the "Ink Detail" screen depicted in Fig. 23 comprises two columns in which to enter information for the two plies, respectively. A similar

"Ink Detail" screen (not shown) can be generated for the exemplary business form described above. The computer generates this screen with three columns in which to enter ink color and type for the three paper plies specified for the business form, respectively.

The screens depicted in Figs. 24 and 25 illustrate simple and detail specification screens, respectively, for entering information regarding punching, drilling and perforations that may be desired for a custom business form, for example. Accordingly, "Punching" and/or "Perforation" appears in the left column of the "Specification Summary" screen (Fig. 14) for those business forms having these features. Fig. 26 illustrates a review screen for an envelope that is analogous to the screen depicted in Fig. 15 for a business form. The screens depicted in Figs. 27 and 28 are exemplary simple specification screens for an envelope. Fig. 29 illustrates a detail specification screen corresponding to a roll-type item. Figs. 30 and 31 illustrate, respectively, simple and detail specification screens for electronic printing.

As stated previously, data is entered into the fields of screens (e.g., the white boxes appearing in the screens depicted in Figs. 15-17) automatically by the computer, which retrieves data from local memory or from the data server 36, or manually by the sales representative using conventional data input devices such as a keyboard or a mouse. Exemplary data has been provided in the screens depicted in Figs. 14 through 21 which also appears in the exemplary item specification in Appendix A. The above-described screens are designed to highlight and/or restrict the user to only those menu options that are available based on previous inputs.

As shown in Block 141 of Fig. 4, the sales site computer preferably validates an item specification being

transmitted for an estimate. The validation process prevents the sales representative from selecting features for a custom item that cannot be priced or manufactured. For example, if the sales representative selects a type of item such as a mailer, the screens generated by the PC prompt the sales representative to select features that are valid for mailers, and prevents user selection of features not permitted for this product type. The validation logic for item specifications is preferably controlled at the corporate office.

Because the sales office computers 41, 62 and 64 are networked to each other and to the corporate office computers 29 and the plant computers 46, it is possible to copy most of the information that is needed for an estimate and item specification from data entered from a previous order for that customer, thereby eliminating the need to re-enter redundant information. In addition, a sales representative can generate several item specifications for the same product. For example, several item specifications can be generated which specify different materials to manufacture the desired product for price comparison purposes. These item specifications are then used generate a number of estimates. The sales representative can select a subset of these item specifications and their corresponding estimates and store them as proposals using the "Proposal" option in Fig. 9. These proposals contain the estimates that the sales representative wishes to present to the customer. Sales management personnel at the corporate office 16 or a sales site 12 or other authorized personnel can calculate an estimate conversion ratio, that is, the number of proposals submitted to a customer that are eventually transformed into an order, or download proposal and order data to a corporate office computer 29 to calculate the estimate conversion ratio. This data is

useful to monitor sales representatives' performance and to identify products which have a poor or low estimate conversion ratio, among other uses.

5 The simple and detail specification screens are *
provided with "Ok" buttons 133 such as those on the screens
depicted in Figs. 28 and 30 which return the representative
to the "Specification Summary" screen when clicked using a
mouse, for example. Alternatively, after a sales
10 representative has finished reviewing a simple or detail
specification screen (e.g., the simple and detail
specification screens depicted in Figs. 18 and 19), he or
she can return to the "Specification Summary" screen (e.g.,
the screen depicted in Fig. 14) by clicking a button 131 on
the screen. The computer is programmed to generate a drop-
15 down menu (not shown) in a manner conventional to WINDOWS™
applications, which provides the option of closing the
screen to return to the "Specification Summary" screen.
Once the representative has completed entering a
specification, at least insofar as providing sufficient
20 information for obtaining an estimate, the representative
can click the icon 127 representing an estimate in the tool
bar 129 of the "Specification Summary" screen for the item
to be manufactured.

25 With reference to Fig. 9, the sales representative
need not create or modify an item specification and then
activate the "Estimate" icon 127 for the purposes of
obtaining an estimate. He can select one of the
"Estimate", "Proposals", "Orders" or "Reports" buttons
without first entering data into specification screens
30 (e.g., Figs. 10 through 31). For example, the sales
representative can highlight the name of an existing item
specification from among those listed in Fig. 9 and
activate the button corresponding to the "Proposals" option
to retrieve a corresponding proposal from a memory device

(e.g., file server 66). Similarly, if the item specification for a custom product has already been stored but, due to a change in paper prices, the estimate needs to be updated or otherwise generated, the sales representative can activate the button for the "Estimates" option. Regardless of whether the "Estimates" button in Fig. 9 is used, or the "Estimates" icon 127 is selected, the PC 62 or laptop computer 64 or 41 is programmed to generate the screens depicted in Figs. 32 through 35.

With reference to Fig. 32, items for which specifications have been created and stored for a particular customer appear on the screen, along with other information retrieved preferably from the database by the data server 36 such as contract number and zip code. A sales representative selects the item for which an estimate is desired by highlighting the appropriate item and clicking a mouse, for example, or depressing a key on a keyboard. The sales representative's computer generates an "Estimate Detail" screen, as depicted in Fig. 33, which displays at least one column of information. The column comprises values for a number of parameters which can affect a cost estimate for a particular item such as item number 123456. Two or more columns can be entered by the representative to determine how cost is affected when different parameters are considered. Thus, a sales representative can determine how much of a concession (i.e., price reduction), if any, he or she can offer a customer as the result of increasing the quantity of the item ordered or changing terms for storage, for example. The screen is then closed and a data transmit function initiated by clicking the "Ok" button 133. Alternatively, a "Transmit" option can be provided in the drop-down menu (not shown) corresponding to the "Tools" option in the menu pad 117 of Fig. 14. As shown in block 142 of Fig. 4, the

item specification, estimate header and estimate detail information is transmitted via the WAN (e.g., routers 68 and 52, or the X.25 communication line and the RLA Gateway 40) to the corporate office to obtain estimate data.

5 With reference to block 144 of Fig. 4, the corporate office computer system is programmed to validate the item specification. As described above, the corporate office maintains various types of data such as material costs, pricing factors, estimate data, contract data, and valid
10 specification data, as well as specification costs and parameters. Material costs and specification costs are generally updated and maintained by the Purchasing and Industrial Engineering departments of a manufacturing plant. For example, personnel in these departments are
15 generally responsible for supplying data relating to material costs, material quotes, labor and burden costs to the data server 36. A Estimating or Industrial Engineering department is preferably used to maintain estimate parameters such as the pricing parameters and valid
20 specifications. For example, an Estimating department and an Operations and Sales department can be used to obtain and enter into the data server 36 data such as price inflators and deflators, mark-ups, and contingency factors which can affect specification values and pricing
25 parameters.

 The validation process, block 144, involves cross-validating a selected item-type such as a business form against an item specification to ensure, for example, that a fastener was not ordered for a single ply-type business
30 form. The selected item-type can be validated against an item specification to ensure that the appropriate materials were selected and that the correct die information was entered. Validation of the specification can comprise field-level edits and cross-validation. In addition to

production constraints, item specifications sent to the corporate office to obtain estimate data can also be validated or reviewed because they are for a particular customer, are estimated to cost more than a predetermined amount (as described below in connection with block 150) or are for a particular type of product that is not selling well, for example. Software for the corporate office computers can be created to automatically review incoming item specifications to identify item specifications meeting certain search criteria such as customer name and cost and/or list prices within certain ranges of values. The item specifications and/or estimates meeting these criteria can be required to undergo review by a person. This is advantageous when customer relations require application of concessions to cost, or extra precautions to minimize estimate amounts or production mistakes. Estimates above a certain amount can also require review to ensure that the cost of an item that is complicated and therefore more difficult to manufacture is not underestimated.

With reference to the negative branch of decision block 145 and block 146, estimate generation incorporates data relating to the number of manufacturing processes of a job (e.g., imaging for producing color forms), waste matrices, effectivity dates for list price, set-up burden rates by a logical machine type within a division, material charges, among other data. The estimating data is maintained by the Estimating subsystem 90 (Fig. 2). In accordance with an embodiment of the invention, an estimate can be prepared using one or more tables or matrices which can be generated, for example, using a spreadsheet-type software program (e.g., LOTUS or EXCEL or custom developed software), and which use the product type, different form features, and quantity indicated in the item specification, among other data, to generate cost and list pricing

information. These matrices preferably reside in the Estimating subsystem 90. As will be described below in connection with block 158, the sales representative uses cost and list pricing information to determine a sell price for the manufacture of a custom form. Pricing information for stock items (e.g., telephone message pads or pads of lined paper that can be used by anyone) can also be generated using price matrices. The matrices preferably comprise standard cost information which can be generated using the Labor and Material subsystem 94 or the Estimating subsystem 90.

The Estimating subsystem 90 can be used to do some calculations using the matrices, or the matrix information can be transmitted to the sales site where calculations are executed. In either case, important pricing information is first obtained from the Estimating subsystem 90 before a sell price is determined therefrom and presented to a customer, in accordance with the present invention. This realizes a number of advantages for the present invention. This provides corporate office personnel some control over sales representatives' sell price quotations to ensure that products are not undervalued, that estimates for similar products are consistent and that estimates reflect concessions made to customers. As stated previously, the integrity of the pricing information is ensured when it is updated in a central location; otherwise, pricing information distributed among several sales sites may not be updated consistently. Sales sites would therefore be determining price from different matrices. Further, proprietary pricing data and algorithms are best kept at a central storage location for security reasons rather than being distributed to sales sites. Also, corporate office personnel realize a number of competitive advantages by maintaining a central repository of pricing and estimate

data at the corporate office. Statistical analysis can be performed on the data to gain greater market visibility. For example, information such as the number of estimates that evolve into production orders can be used to ascertain which customers have not been approached by a sales representative or bring a large volume of business. The data can reflect a need to reward or further train sales representatives, or to offer a customer a pricing discount.

With reference to the affirmative branch of decision block 145 and block 147, the Estimating subsystem 90 can generate an estimate for an item that is to be priced in accordance with a contractual agreement between the customer and the corporation. As will be described below in connection with Figs. 45 through 53, contract price matrices can be generated to reflect contractual terms. Contract price matrices can be created as a subset of the standard or generic price matrices used to generate estimates for non-contract items. The generic price matrices can be used for estimating any customers' orders. The generic price matrices are generally based upon raw material prices, equipment and other factors that affect actual cost to fulfill an order. A custom price matrix, on the other hand, can include contractual concessions between the forms manufacturer and the customer resulting in prices below, for example, the standard prices, i.e., discounts for the volume of business the customer brings to the manufacturer. An advantage of using contract price matrices is that they support contract proposal generation by corporate personnel in, for example, a Contract Administration department of the corporation by developing matrices of multiple items. This is particularly useful when the corporation is offering concessions to a customer with a large number of existing forms. The contract matrices eliminate the need to perform an estimate for each

form for contract proposal purposes. Since contract terms are stored at the corporate office, corporate personnel can perform contract profit and other types of analysis, and provide contract customers with a common reference for pricing.

5 With reference to decision block 148, the present invention provides for the review and maintenance of estimates based on user-defined parameters, for the generation of list price promptly after a request for an
10 estimate is made (provided the estimate does not require review), for the generation of a new list price and a repeat list price for estimates of new items, and for messaging back to the sales representative to inform him to which department an estimate is being routed should the
15 estimate require review by corporate personnel.

With reference to the affirmative branch of decision block 148 and block 150, review of an estimate, for example, by an Estimating department or Operations and Sales Management department is advantageous for a number of
20 reasons. As stated previously, a corporate office computer or Operations and Sales Management personnel can review estimates using various criteria when the estimates require use of a special material, a particularly large volume of material, or require complex construction or a new or
25 special specification. Estimates which involve a particularly high dollar value or a particular customer can also necessitate review by corporate office personnel. This gives corporate office personnel an opportunity to use pricing information for processes that is external to the
30 Estimating subsystem 90. For example, while a mailer product with six plies can be priced by the Estimating subsystem 90, the item can present difficulties to the plants. Batch validation of an item specification and estimate for the mailer allows corporate office personnel

to review the estimate and make changes as needed. Batch validation also allows estimates for strategic customers or which exceed a predetermined dollar amount to be identified for review.

5 Following estimate review, the corporate office personnel responsible for reviewing estimates can enter and maintain notes on estimate and production orders and maintain item specifications. These corporate office personnel have the advantage of being able to maintain
10 contingency and mark-up factors on an individual estimate basis, as well as being able to devise flexible exception criteria for estimate review notification. In addition, corporate office personnel can enter recommended and/or minimum sell prices.

15 With continued reference to block 150, review of an estimate is an iterative process. If the corporate office determines that an estimate is unacceptable, item specifications can be changed, as indicated by the affirmative branch of decision block 151 and block 152.
20 For example, a less expensive grade of paper can be used or a larger quantity of forms can be ordered. An audit trail can be created for revised estimates to document changes.

25 With reference to block 153 of Fig. 4, an estimate that does not require review, or a validated estimate, is transmitted back to the sales representative via the WAN connecting the sales office to the corporate office. With reference to block 154, the estimate information is recaptured by the computer (e.g., PC 62 or 64, or laptop computer 41). At least part of the recaptured information
30 is automatically displayed on the computer monitor in the format of the "List Price Summary Recapture" screen (Fig. 34). The estimate information recaptured at the sales site preferably comprises cost and list price, recommended or minimum sell price where appropriate, order quantity, item

specifications, and freight and storage information. The "List Price Recapture" screen provides list price information for the first order of the desired custom product and the list price information for repeat orders, which are generally subject to discount pricing. The list price is preferably broken down to separate elements such as specifications and materials. The sales representative has access to alternate information such as price and quantity breaks, alternate materials, alternate specifications and minimum material requirements. The sales representative also has the ability to print out the estimate.

With reference to the affirmative branch of decision block 156, the sales representative has the option of revising the estimate or simply obtaining multiple versions using different materials, quantities, and so on. A parameter filter is provided for changed or revised estimates for a parameter-controlled filtering of changed or revised specifications. A sales representative can activate the "Ok" button 133 to close the screen. The computer then generates a "Sell Price Calculator" screen, as depicted in Fig. 35. The sales representative uses the list price from the screen depicted in Fig. 34 to determine a sell price, taking into account other factors such as concessions, as shown in block 158. Once the sell price is determined, the sales representative can close the screen depicted in Fig. 35 in a manner that is conventional to WINDOWS™ software (e.g., by selecting the "Ok" button 133 or the "Close" option in a drop-down menu (not shown) associated with the button 131). The PC 62 is programmed to display the screen depicted in Fig. 9.

Before generating a production order, the sales representative preferably enters information regarding usage of the item to be manufactured into usage screens

(e.g., screens depicted in Figs. 36 through 40). The usage screens are generated by the PC 62 or laptop computer 41 or 64 following selection of a "Usage" option in the drop-down menu associated with the "Tools" option in the menu pad 117 of Fig. 14. The usage screens are advantageous because they allow some degree of validation of the manufacturability of the ordered item before the order is sent to the plant. Usage screens vary depending on the type of item for which they are used. For illustrative purposes, the usage screens depicted in Figs. 36 through 40 are for a business form. The screens comprise different types of processes and after-handling equipment that a customer uses on or with the ordered product once it is shipped and received. For example, the sales representative can enter the type of burster or printer used with a form or indicate that the form is to be written on using a No. 2 lead pencil for computerized tabulation. By viewing this screen, the sales representative can review the order for quality control. The selected paper type may contain a coating that cannot be satisfactorily used with No. 2 lead pencils or the customer's printer. The sales representative can therefore recognize potential problems with the order before it is sent to the plant, thereby eliminating time wasted because the plant has rejected an order.

With reference to blocks 160 and 162, the sales representative determines sell price from the estimate data and reviews the proposal with the customer. As indicated by the negative branch of decision block 162 and block 164, the customer can request a production order from an estimate which is found to be acceptable. The sales representative can use the PC 62 to automatically extract information from the estimate and add detail to generate a production order. The conversion of an item specification

and estimate data into a production order minimizes the re-entering of previously captured information. The sales representative can also enter sell price (or reference contract pricing matrices, if appropriate), ship date, the production plant, as well as the identification of any supporting documentation. The production plant can be automatically selected by the mainframe computer 18 or selected by corporate office or sales office personnel.

If the "Order" button depicted in Fig. 9 is activated, the sales representative's computer is programmed to generate a number of screens for generating an order such as those screens depicted in Figs. 41 through 44. Alternatively, an "Order" icon can be provided in the tool bar 129 in Fig. 14 or an "Order" option can be provided in the drop-down menu associated with the "Tools" option in the menu pad 117. The first screen generated by the PC 62 or laptop computer 64 or 41 is preferably the "Sales Order Header" screen depicted in Fig. 41. The sales representative can provide the shipping information. The customer information, however, is preferably automatically provided by the computer, which retrieved the data from local memory or from the data server 36. Multiple shipping sites can be specified, as well as credit approval or other information from the corporate office relating to the customer. The sales representative's computer is programmed to generate the "Production Order Detail" screen depicted in Fig. 42 after the "Ok" button 133 is activated on the "Sales Order Header" screen. The "Production Order Detail" screen is configured to automatically display a number of list and sell prices in respective columns for the customer item number selected using the screen depicted in Fig. 9. For illustrative purposes, only one sell and list price is shown for the item number 123456 displayed in Fig. 42. The identification numbers of the proposal and

estimate used to calculate the displayed list price are automatically provided by the computer. Alternatively, the sales representative can enter another item number, proposal number or estimate number using a keyboard.

5 The sales representative selects one of the columns in Fig. 42 by highlighting the desired column and activating the "Select Item" button. The PC 62 is programmed to generate a number of screens for guiding the sales representative to enter additional information in the item
10 specification that was not required to be entered previously for the purposes of obtaining an estimate. Thus, the amount of information the sales representative needs to enter to generate proposals and ultimately orders is minimized. For ordering a custom continuous type
15 business form product, these screens can include a "Marginal Words" screen (Fig. 43) and a "Concessions Approval" screen (Fig. 44).

As shown in block 166, each computer at the sales office and each laptop computer 41 preferably operates in
20 accordance with the SIN 86 to validate production order details, as well as cross-validate selected items with reference to the production order details. The sales representatives' computers are also programmed to determine whether or not a customer has a contract with the
25 manufacturer, to ensure the customer has a favorable credit status and to check for a concession percentage. The SIN 86 also stores in memory a version of the estimate used to produce the production order as part of an audit trail. The sales representatives' computers are further programmed
30 to prevent expired estimates from being converted into production orders, to ensure that each production order is linked to a particular estimate unless the order is the result of an outside purchase, as well as to check for concession percentage level. The latter feature enables

sales management to be notified when acceptable concession levels are disregarded.

5 The validated production order is preferably sent electronically to the corporate office, along with copy folder information comprising the image of the form or label via the WAN (e.g., the routers 68 and 52, or the RLA Gateway 40), as shown in block 168. This is done using, for example, a "Confirm" button (not shown) on the screen in Fig. 41 or a "Transmit Order" option in a drop-down menu associated with the "Tools" option in the menu pad 117 (Fig. 9). These items can also be sent via regular mail, or by facsimile or other digital data transmission technique. The SIN is configured to provide the sales representative with a message (e.g., in a pop-up box or status window on the sales representative's monitor) confirming that the order was sent and the name of the destination plant. In addition, plant computers are configured to transmit a message via the WAN acknowledging that the order was received. Similar messaging occurs at the corporate office when, for example, an estimate cannot be generated immediately. The sales representative is notified that estimate review is required and given the option to proceed with the review or to cancel the request for estimate data using a button generated within the status window or message pop-up box.

15 The sales representative can use the Forms Management subsystem 124 to design a new form in addition to entering information for an item specification. This form can be electronically transmitted along with the item specification and a request for an estimate to the corporate office. While transmission of this data is preferably downloaded from a PC 62 or laptop computer 41 or 64 onto a digital communication line, the data can also be

printed on a laser printer connected to the network 60 and transmitted via regular mail or by facsimile.

5 With reference to the affirmative branch of decision block 170 and block 172, production orders can be reviewed by production management personnel who review plant and equipment utilization and have the option to override the plant entered by the sales representative, as well as enter an override reason. Thus, inquiries on production orders can be made on an exception basis.

10 With reference to block 174, a production order which does not require review, or which has been found acceptable upon review by production management personnel, is subsequently transmitted electronically to the plant. As shown in block 175, the MIPS at the selected plant in turn
15 places the production order in a queue for planning purposes by the Planning Bill of Materials subsystem 102. The Planning Bill of Materials subsystem 102 audits the estimate, that is, checks item specifications. As shown in blocks 176 and 178, sometimes changes need to be made at
20 the plant because of, for example, a labor shortage or mechanical problem. The plant can communicate these changes in the production order via, for example, the minicomputer 56, to the sales representative or customer via the LAN and routers 52, 54, and 68 or the RLA Gateway
25 40 (Fig. 1), as indicated by the affirmative branches of the decision blocks 178 and 180. Changes to the production order generally require changes in the item specification. Thus, the revised item specification is validated and then transmitted to the corporate office for another estimate,
30 as shown in blocks 140, 141 and 142. If the item specification changes are minor (e.g., are not likely to affect the previously generated estimate), the plant personnel can make the changes and notify the sales representative, as shown in blocks 182 and 184.

If the plant does not require changes in the production order, the order is manufactured, as shown in block 186. As indicated in block 188, the completion of the job is reported to the Labor and Material subsystem 94 and the Estimating subsystem 90 for actual cost analysis and reporting, as well as to the sales site to keep the sales representative apprised of the status of the order.

The screens in Figs. 45 through 53 can be generated on a mainframe terminal, for example, to guide contract management personnel at the corporate office when entering information for the creation of contract price matrices and generating a hard copy of a custom price matrix. Exemplary custom price matrices are depicted in Appendices B and C. The contract information entered using the screens is processed to extract a subset of the generic price matrices which are pertinent to a particular customer, as indicated in Appendix C.

With reference to Fig. 45, a user is prompted to enter general information in the following, correspondingly named fields: ACTION, PRODUCT TYPE, STANDARD CONTRACT SCHEDULE, CUSTOMER NAME, and NEW/REPEAT. The screen shown in Fig. 45, as well as the subsequent screens used for contract set-up, provide the user with at least two menus. A first menu 252 is provided at the top of the screen for generally editing and making inquiries as to a particular contract or a particular contract price matrix. Another menu 254 is provided at the bottom of the screen which comprises such functions as viewing the next page of a screen, viewing the next screen or printing a particular contract price matrix. The menu 252 at the top of the screen is hierarchical in nature because it provides the same options to make inquiries about ("I"), change ("C") or delete ("D") a currently stored contract, contract price matrix, or a particular entry within the contract or matrix. Further,

the user can add ("A") a new contract, contract price matrix or entry within the contract or contract matrix.

Regarding the menu 254 at the bottom of the screen, the user can depress a key on the keyboard to: (1) display
5 a table menu on the screen; (2) advance to the next screen; (3) return to a prior screen; (4) move forward or (5) backward among the multiple pages that compose a screen; (6) specify more widths; and (7) print a schedule, among
10 other functions. The functions assigned to keys on a keyboard can vary depending on the screen.

With continued reference Fig. 45, most of the fields in the screen and the following screens are self-explanatory. The STANDARD CONTRACT SCHEDULE field is automatically filled with a unique identification number
15 when using the ADD or "A" menu option. The contract schedule number, along with the customer's name and the product type, appear at the top of the exemplary matrix (Appendix C). The STANDARD CONTRACT SCHEDULE field refers to the standard price-based schedule used as the basis for
20 selection for the contract price matrix being created. This field defaults to the current price schedule being used unless the user enters the number of another prior price-based schedule. The value in this field is the default value for the same field in subsequent screens.
25 The PRICING FACTOR and the EFFICIENCY FACTOR fields are provided with values by the user which also serve as default values for subsequent screens. The PRODUCT TYPE field is provided with one or more values that is obtained from the corporate office. The data server 36, for
30 example, maintains a look-up table of unique identification numbers for each product offered for sale to customers, including forms, labels and other items produced at the plants, and ready-made items offered for resale. This value is a default value in subsequent screens.

5 The screen depicted in Fig. 46 prompts the user to
enter one or more desired widths for each product type that
can be priced using the contract price matrix being
created. The screen depicted in Fig. 47 prompts the user
to enter general information for developing composition
pricing such as ACTION, STUB LENGTH, and PLY NUMBER. The
standard base composition charge is retrieved from one of
the generic price matrices. The exception base composition
charge is calculated by multiplying the PRICE and/or the
10 EFFICIENCY FACTOR, if previously entered, by the standard
base composition charge. The base composition charge,
whether it is a standard or exceptional one, is shown at
the top of the exemplary matrix in Appendix C. Prices for
additional charges and rules, set-up and run charges, and
15 other factors can be added to this base, pre-press price.
The user also has the option of entering special
composition rules to retrieve selected prices from a
database of general price-based rules maintained at the
corporate office. As shown in the exemplary matrix in
20 Appendix B, these rules can include, for example, pricing
variances due to changes in the composition, heading
changes, and printing on the back of a form.

 Fig. 48 depicts a RULES SELECTION screen generated by
the mainframe computer to prompt a user to invoke or delete
25 a rule. The rules aid in the process of selecting data
from the general price matrices that best suits a
particular customer and contract terms. The rules can be
stored in a look-up table in the database at the corporate
office in accordance with their numbers and corresponding
reference names. Rules are entered on the screen in Fig.
30 48 by their number and reference name, or another name
assigned by the user. The screen thereafter serves as a
reference or list of rules indicating the rules employed
for that particular custom price matrix. An initial rule

selection using the RULES screen allows the user to operate at the rule level, that is, the user is provided with a complete list of rules from which the user can select a list of potentially applicable rules by typing a "H" or a "D", respectively, in the left margin of the rule entry line. The second selection process using the RULES screen is at the sub-rule level of the rules selected initially. In other words, rules selected from the list of potentially applicable rules are transferred to the rule entry screen through which the RULES screen was invoked, i.e., the COMPOSITION PRICING, SET-UP PRICING and ADDITIONAL CHARGES screens. The RULES screen need not be invoked if the user already knows the subrule numbers needed to prepare the contract pricing matrix.

With reference the screen depicted in Fig. 49, the SET-UP PRICING screen is similar to the composition pricing screen in Fig. 11. Set-up prices cover the cost of preparing plant equipment to complete a particular job. For example, special equipment or equipment configurations may be required to create a form that has perforations and requires printing on both sides thereof. The standard base set-up charge is retrieved from a generic priced-based matrix. The exception base set-up charge is calculated based on the standard base set-up charge and the PRICING and/or EFFICIENCY factors. Set-up rules can also be used to retrieve prices from the general price base rules database using the RULES SELECTION screen depicted in Fig. 48. As shown in the exemplary matrix of Appendix B, these rules can include additional colors, back printing, copy and color ink or paper changes, perforations, and hole punching and collating charges.

A RUN CHARGES screen (Fig. 50) is generated for the user to enter general information for developing run charges. Run or running charges comprise charges for

running or processing paper through a press for printing, hole punching, or folding, for example, collating the various plies of multiple ply forms together, packaging, and otherwise preparing the forms for shipment. Running charges can also include charges for materials such as paper, carbon, ink, and cartons. Running charges are generally expressed in terms of multiples of forms, i.e., "per 1,000" or "per M". The values in the CONTRACT SCHEDULE, STUB LENGTH, PRODUCT TYPE, PLY NUMBER, PRICE FACTOR, EFFICIENCY FACTOR AND WIDTH fields are carried over from previous screens. Standard run charges are retrieved from the general price matrices and can be multiplied by PRICE and/or the EFFICIENCY factors to calculate exception run charges.

The ADDITIONAL CHARGES screen depicted in Fig. 51 prompt a user to enter general information for developing additional charges to be reflected in a contract price matrix. Standard flat charges and run charges are retrieved from the generic price rules database and are used with the PRICE and/or EFFICIENCY factors to calculate exception flat and run charges. Rules can also be used to retrieve prices from the general price base rules database using the RULES SELECTION screen depicted in Fig. 48. As shown in the exemplary matrix of Appendix B, these rules can modify prices in order to charge for ink matching, shrink wrapping and trimming.

With reference to Fig. 52, the VOLUME DISCOUNTS screen prompts a user to enter general information for establishing volume discounts in the contract price matrix under development. The user can create discounts based in dollar value and quantities of items ordered. The exemplary matrices of Appendices B and C show pricing discounts based on the quantities ordered.

As indicated Fig. 53, the MATERIAL UPCHARGES screen prompts a user to enter general information for establishing material upcharges in the contract price matrix under development in fields such as the ACTION, WEIGHT, COLOR, GRADE and IMAGE fields. The remaining fields contain values carried over from previous screens. The standard upcharges are retrieved from a general price-based matrix and used with the PRICE and/or the EFFICIENCY factors to calculate exception upcharges.

After the user makes entries in each of the above screens, the standard contract schedule specified in the first screen, which is maintained by the Estimating subsystem 90, has information selected therefrom in accordance with the parameters defined by the fields in each of the above screens. The selected data for a contract matrix is subsequently stored in the database as a contract schedule or matrix, which is similar to the standard price matrices, and maintained by the Estimating subsystem 90. The contract pricing matrix can be condensed and printed on both sides of a form preferably using a laser printer connected to the corporate office PC network or LAN.

In accordance with another embodiment of the present invention, a number of Estimating offices (not shown) can be connected to the corporate office network 24 using a router in much the same way as the sales offices and plants. These Estimating offices can use an on-line system via the LAN 24 to receive estimates from sales offices and to review and revise them. The Estimating offices provide for more timely responses to requests for estimates from sales offices than the corporate office because they are dedicated to this purpose. The Estimating offices store in computer memory the following types of information: estimating logic information, estimate specifications and

valid specifications. The Estimating offices can perform a "help desk" role in that they can focus on larger and more unusual estimates than the corporate offices handle. In general, Estimating offices maintain estimates and specifications, valid estimate specifications, transmit specifications to the corporate office and to the sales offices, receive price information from the corporate office database, review and maintain an estimate filter and perform messaging.

10 While certain advantageous embodiments have been chosen to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims.

APPENDIX A**FORM SPECIFICATION**

FORM WESPASSREP REV 2.0 April 93 PAGE 1 of 3

GENERAL INFORMATION					
CUSTOMER ITEM NUMBER 123456		ITEM DESCRIPTION Example Form			
PRODUCT TYPE Custom Continuous					
WALLACE ITEM NUMBER		WALLACE DESCRIPTION			
DATE ADDED 12/22/94	DATE LAST UPDATE 12/22/94	CONTRACT NUMBER		PRODUCT CODE	
CUSTOMER CONTACT J. Doe			PRIMARY VENDOR		
CUSTOMER CONTACT PHONE # (708) 555-1220			SECONDARY VENDOR		
ORIGINATING DIVISION		GROUP 1 KEYWORD		REVISION NUMBER	
ORIGINATING DEPARTMENT Accounting		GROUP 2 KEYWORD		REVISION DATE	
JOB POINT Plant		GROUP 3 KEYWORD		JOB TYPE JL	
LOGO ID			ELECTRONIC FORM ID		
FOLLOW UP DATE		FOLLOW UP REASON			
DATE CANCELLED		DISPOSITION OF STOCK		REPLACEMENT ITEM NUMBER	

USAGE INFORMATION						
MINIMUM ORDER POINT 10,000	ORDER IN MULTIPLES OF 20000	MINIMUM PRINT QUANTITY 40000	NUMBER OF LOCATIONS 1	ESTIMATED ANNUAL USAGE 120,000	QTY UOM Thousand	QTY UOM FACTOR 1,000
STORAGE TERMS		LEAD TIME (IN DAYS)		CHARGEBACK		
# WORKSHEET 4	# PRINTS 3	# SHEETS 1	MANUFACTURING	RELEASE FROM STOCK	PRICE	PRICE UOM FACTOR
PACKAGING METHOD			FORMS PER PACKAGE		FORMS PER CARTON	
SPECIAL REMARKS						
SPECIAL ORDERING INSTRUCTIONS						

FEATURES			
	Critical Form		
Legal Review Required	Form Design Complete		
	Remoist Glue		

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APPENDIX A

FORM SPECIFICATION			
ITEM # 123456		FORM WCFRMSPEC REV 3.0 APR 92 PAGE 2 of 3	
RECYCLED PAPER		RECYCLED %	
PUNCHING		POST CONSUMER WASTE %	
# HOLES 3		TYPE 3/32" Round Hole	
CENTER TO CENTER LENGTH 2 1/4		PLACEMENT Parallel	
PERFORATIONS		TYPE Vertical	
# PERFS 1		LOCATION	
BACK PRINTING		BACKER STYLE	
NUMBERING		BACKER	
TYPE 7 Digit Jumbo Numbering			
SERIAL NUMBERING		BINDER	
MICR NUMBER SPECIFICATIONS:		TRANSFER NUMBER	
AUXILIARY CODES		CHECK	
DIE CUT		DIE CODE	
HOT MELT CARBON COATING		# PLYS	
AREA COATED CARBONLESS		TOTAL Sq. in. COVERAGE (ALL PLYS)	
WAL-LABEL		TYPE Wal-Lab 8	
BOOK BINDING		BINDING TYPE	
TRANSFER TAPE		# OF STRIPS	
WAL-SPOT		TOTAL Sq. in. COVERAGE	
MYLAR PATCH OR STRIP		# OF STRIPS	
POCKET FORM		SIZE (SQ. IN.)	
ACCESS SET		TYPE	
FLOW FOLDING (?)		# FOLDS	
MAILER		CONSTRUCTION	
ENVELOPE		# EXTRA	
		# PL. SHEETS	
		FLAP SIDE	
		FASTENING TYPE	
		# WINDOWS	
		HEIGHT	
		WIDTH	
		TYPE	
		LOCATION	
MATERIAL CODE			
FACE STOCK			
LABEL ADHESIVE			
LABEL UNDERCARRIER SHEET			
LABELS ACROSS		PER FOLD	
S&B TYPE			

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APPENDIX A**FORM SPECIFICATION**

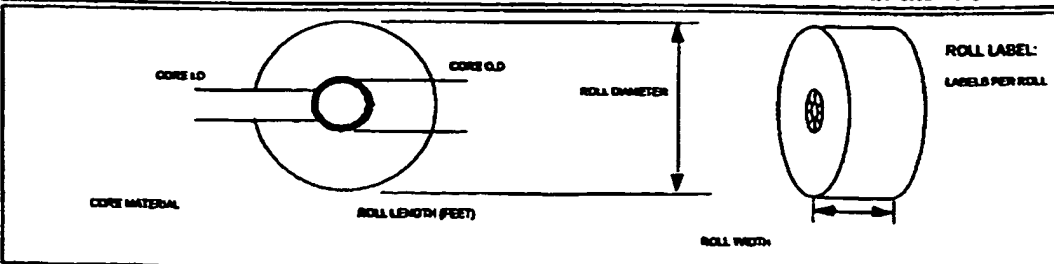
ITEM # 123456

FORM WCPH887P REV 2.0 PAGES 3 of 3

CONSTRUCTION									
# PLYS 3		# CARBONS 0		FORM SIZE STAP 11.0000			FORM SIZE WIDTH 8.5000		
PLY	PAPER WIDTH	PAPER WEIGHT	PAPER COLOR	PAPER GRADE	MARGIN WORDS		CARBON WIDTH	CARBON GRADE	CARBON SPEC.'S
1	8.5000	15#	White	CB Grade 1					
2	8.5000	14#	White	CFB Grade 1					
3	8.5000	14#	White	CF Grade 1					
4									
5									
6									
7									
8									
9									
10									

FASTENING					
No & TYPE		LOCATION	PARTS		CARBONS
Crimplock		Right	PARTS: 1	THRU: 3	CARBON THRU
Glued Crimplock		Left	PARTS: 1	THRU: 3	CARBON THRU
			PARTS	THRU	CARBON THRU
			PARTS	THRU	CARBON THRU
			PARTS	THRU	CARBON THRU

COLORS									
FRONT					BACK				
PLY	INK COLOR 1	INK COLOR 2	INK COLOR 3	INK COLOR 4	INK COLOR 5	INK COLOR 1	INK COLOR 2	INK COLOR 3	INK COLOR 4
1	Black	Blue							
2	Black								
3	Black				Black				
4									
5									
6									
7									
8									
9									
10									
MULTIPLE COLORS PRINTING									
STANDARD: 2		NON-STANDARD:		MATCH		FLUORESCENT		FLUORESCENT MATCH	

**SUBSTITUTE SHEET (RULE 28)**

APPENDIX B

CUSTOMER NAME: T.R.G.				CONTRACT SCHEDULE : 01001			
PRODUCT TYPE: UNIT SET				STUD SIZE: 8 1/2			
P R E P R E S S				WIDTHS			
BASE COMP				6 1/8	7 5/8	11 5/8	14 5/8
				240.00	240.00	265.00	240.00
ADD'L RULES							
MAJOR CHANGE				145.00	145.00	164.00	164.00
MINOR CHANGE				90.00	90.00	97.00	97.00
HEADING CHG				62.00	62.00	64.00	64.00
BACK PRINTING				105.00	105.00	112.00	112.00
MULTIPLE CLR				128.00	128.00	140.00	140.00
S E E U P				STUD SIZE: 8 1/2			
BASE SETUP				6 1/8	7 5/8	11 5/8	14 5/8
B OF PLIES							
02				137.00	137.00	137.00	137.00
03				168.00	168.00	168.00	168.00
04				198.00	198.00	198.00	198.00
05				218.00	218.00	218.00	218.00
06				259.00	259.00	259.00	259.00
ADD'L RULES							
ADD'L COLORS				52.00	52.00	52.00	52.00
BACK PRINTING				68.00	68.00	68.00	68.00
COPY CHANGE				38.00	38.00	38.00	38.00
COLOR CHANGE				38.00	38.00	38.00	38.00
NUMBER SET-UP				77.00	77.00	77.00	77.00
VERTICAL PERF.				14.00	14.00	14.00	14.00
HORIZ PERF.				33.00	33.00	33.00	33.00
FOLD-MILE-PHEN				25.00	25.00	25.00	25.00
COLLATOR CHG				60.00	60.00	60.00	60.00
RUN CHARACTERS				STUD SIZE: 8 1/2			
BASE RUN				6 1/8	7 5/8	11 5/8	14 5/8
B OF PLIES							
02				29.66	29.66	37.10	42.78
03				44.46	44.46	54.93	62.52
04				53.08	53.08	64.94	74.52
05				66.43	66.43	81.41	94.52
06				78.80	78.80	95.40	109.51
A B D L C H E S				STUD SIZE: 8 1/2			
RULE DESC				QTY	FEET	RUN/M	
MATCH INK				25	45.00	9.30	
POLYWRAP				25	N/C	9.75	
POLYWRAP				25	N/C	2.48	
POLYWRAP				250	N/C	5.52	
TRIM (CUTTING)					N/C		
VOLUME DISC.				STUD SIZE: 8 1/2			
				6 1/8	7 5/8	11 5/8	14 5/8
QTY TO							
15M				20 X	20 X	12 X	10 X
50M				20 X	20 X	20 X	13 X
100M				33 X	33 X	25 X	15 X
200M-UP				37 X	37 X	27 X	17 X
M A T L U P C R C				STUD SIZE: 8 1/2			
BASE SETUP				6 1/8	7 5/8	11 5/8	14 5/8
PAPER							
150 COL RB				1.44	1.44	2.03	2.50
200 WHT RB				1.95	1.95	2.64	3.15
200 COL RB				3.77	3.77	5.10	6.78
150 WHT CB CCT				6.11	6.11	8.25	10.36
150 COL CB CCT				6.60	6.60	9.30	11.31
140 WHT CFb CCT				8.10	8.10	11.56	14.16
140 COL CFb CCT				8.71	8.71	11.84	14.50
150 WHT CF CCT				4.71	4.71	6.60	8.00
150 COL CF CCT				4.91	4.91	6.90	8.39
1000 CF TAG CCT				30.77	30.77	42.77	51.75
1000 WHT/FLA TC				17.81	17.81	24.43	29.53

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APPENDIX C

CUSTOMER NAME: COOPER CONTRACT SCHEDULE: 2003
PRODUCT TYPE: CUSTOM CONTINUOUS

.....			
.. COMPOSITION ..			
.. BASE COMPOSITION ..			
		STUB SIZE: 11"	
# OF PLYS	CHARGE		
01	230.00		
04	492.00		
..			
.. COMP. RULES ..	CHARGE	REMARKS	
..	
TWO COLOR PRINTIN	136.38		
MAJOR CHARGE - CH	185.37		
.....			
.. SET-UP ..			
.. BASE SET-UP ..			
		STUB SIZE: 11"	
# OF PLYS	CHARGE		
01	495.00		
..			
.. SET-UP RULES ..	CHARGE	REMARKS	
..	
PAPER CHARGE - C	8.40		
PRESS FORCHING	.00		
PRESS NUMBERING	.00		
.....			
.. RUN CHARGES ..			
		STUB SIZE: 11"	
		8 1/2" 9 7/8" 10 5/8" 12" 14 7/8"	
# OF PLYS			
01	19.95	21.95	23.05
04	270.96	303.00	320.52
			352.56
			29.25
			419.64

SUBSTITUTE SHEET (RULE 26)

APPENDIX C

CUSTOMER NAME: COOPER
 PRODUCT TYPE: CUSTOM CONTINUOUS

CONTRACT SCHEDULE: 20003

ADD L CHARGES	STUB SIZE: 11"	WIDTH: 0"	QTY: .00
RULE DESC. • PLAT	RUN/M	REMARKS	
PATTERN COATED	91.46		
CB AND/OR CPB	5.25		

•• MATL UPCHARGES •• STUB SIZE: 11"

WIDTHS	12"	14 7/8"
8 1/2"	9 7/8"	10 5/8"

PAPERS

10.0 WH BOND

PAPERS

12.0 WH BOND

PAPERS

15.0 WH BOND

PAPERS

18.0 WH BOND

SUBSTITUTE SHEET (RULE 26)

APPENDIX C

CUSTOMER NAME: COOPER
 PRODUCT TYPE: CUSTOM CONTINUOUS
 CONTRACT SCHEDULE: 20003

VOLUME DISC		STUB SIZE: 11"		WIDTHS		
		8 1/2"	9 7/8"	10 5/8"	12"	14 7/8"
DOLLAR						
(OR QTY)						
D 20000.00	10.00	10.00	10.00	10.00	10.00	10.00
D 50000.00	1.00	1.00	1.00	1.00	1.00	1.00

SUBSTITUTE SHEET (RULE 26)

What Is Claimed Is:

1. A system for ordering the manufacture of an item comprising:

5 a first computer comprising a monitor, a first memory device and an input device for use by an operator initiating an order, said first computer being programmable to generate a series of prompts on said monitor for guiding said operator to select the item to be manufactured from a plurality of items characterized by respective sets of parameters, at least one of said sets of parameters being different from the other said sets of parameters, to enter data relating to said set of parameters corresponding to the item to be manufactured using said input device, and to store said parameter data in said first memory device;
10
15 and

a second computer comprising a second memory device for storing a database, said database comprising data relating to features of different types of items, to different manufacturing processes, and to material and labor costs for producing items, said second computer being
20 programmable to receive from said first computer said parameter data, to generate estimate data for manufacturing said item using said parameter data and said database, and to transmit said estimate data to said first computer.

25 2. An ordering system as claimed in claim 1, further comprising a third computer located at a manufacturing plant, said first computer being programmable to generate a production order using said estimate data and said parameter data, and to transmit said production order to
30 said third computer.

3. An ordering system as claimed in claim 2, wherein said first computer is operable to transmit said production

order to said second computer which is operable in turn to transmit said production order to said third computer.

5 4. An ordering system as claimed in claim 3, wherein said second computer is programmable to receive and capture said parameter data from said first computer in said database to minimize re-entry of said parameter data using said second computer, and said first computer is programmable to receive and capture said estimate data to minimize re-entry
10 of said estimate data when generating a production order.

15 5. An ordering system as claimed in claim 1, further comprising a third computer located at a manufacturing plant, said first computer being programmable to generate a production order using said estimate data and at least one of said plurality of parameters, and to transmit said production order to said third computer.

20 6. An ordering system as claimed in claim 1, wherein said first computer is operable to transmit said production order to said second computer, and said second computer is operable to subsequently transmit said production order to said third computer.

25 7. An ordering system as claimed in claim 1, further comprising a third computer located at a manufacturing plant, said first computer being programmable to generate a production order using said estimate data and at least one of said plurality of parameters, wherein said first
30 computer, said second computer and said third computer are each connected to a communication network, said third computer being operable to receive said production order via said communication network.

5 8. An ordering system as claimed in claim 7, wherein said third computer is programmable to provide to said second computer at least one data type selected from the group consisting of materials, labor and equipment available in and consumed by the plant to fulfill said production order.

10 9. An ordering system as claimed in claim 8, wherein said second computer is programmable to use said data from said third computer to perform at least one type of analysis selected from the group consisting of estimated cost analysis, actual cost analysis, and order data analysis.

15 10. An ordering system as claimed in claim 8, wherein said second computer is programmable to also use said data from said third computer to generate said estimate data.

20 11. An ordering system as claimed in claim 1, wherein said second computer is programmable to receive data relating to purchasing of said materials and to use said purchasing data to generate said estimate data.

25 12. An ordering system as claimed in claim 1, wherein said database is operable to store data relating to a contract for the manufacture of items, said second computer being programmable to also use said contract data to generate said estimate data.

30 13. A system for ordering the manufacture of an item comprising:

a first computer comprising a monitor, a first memory device and an input device for use by an operator initiating an order to enter customer order data selected from the group consisting of customer biographical data, credit approval data, item identification data, quantity

data, shipping data, handling data, storage data, item usage data, ordering data, planning data, and contract data, and specification data relating to the item to be manufactured, and to store said customer order data and said specification data in said first memory device; and

5 a second computer comprising a second memory device for storing a database comprising data relating to features of different types of items, to different manufacturing processes, and to material and labor costs for producing the different types of items, said second computer being
10 programmable to receive from said first computer said specification data, to generate estimate data for manufacturing said item using said specification data and said database, and to transmit said estimate data to said
15 first computer;

said first computer being further programmable to generate a production order by retrieving said customer order data and said specification data using said first memory and automatically combining said retrieved data with
20 said estimate data.

14. An ordering system as claimed in claim 13, further comprising a third computer located at a manufacturing plant, said first computer being programmable to transmit
25 said production order to said third computer.

15. An ordering system as claimed in claim 13, wherein said first computer is operable to transmit said production order to said second computer, and said second computer is
30 operable to subsequently transmit said production order to said third computer.

16. An ordering system as claimed in claim 13, further comprising a third computer located at a manufacturing

plant and a communication network, said first computer, said second computer and said third computer each being connected to said communication network, said third computer being operable to receive said production order via said communication network.

5

17. An ordering system as claimed in claim 16, wherein said third computer is programmable to provide to said second computer at least one data type selected from the group consisting of materials, labor and equipment available in and consumed by the plant to fulfill said production order.

10

18. An ordering system as claimed in claim 17, wherein said second computer is programmable to use said data from said third computer to perform at least one type of analysis selected from the group consisting of estimated cost analysis, actual cost analysis, and order data analysis.

15

20

19. An ordering system as claimed in claim 17, wherein said second computer is programmable to also use said data from said third computer to generate said estimate data.

25

20. An ordering system as claimed in claim 13, wherein said second computer is programmable to receive data relating to purchasing of said materials and to use said purchasing data to generate said estimate data.

30

21. An ordering system as claimed in claim 13, wherein said database is operable to store data relating to a contract for the manufacture of items, said second computer being programmable to also use said contract data to generate said estimate data.

22. A method of ordering the manufacture of an item, comprising the steps of:

5 selecting the item to be manufactured from a plurality of items characterized by respective sets of parameters stored in a memory device using a first computer, at least one of said sets of parameters being different the other said sets of parameters;

10 generating a specification for the item using said first computer by entering data relating to said set of parameters corresponding to the item to be manufactured using a first input device;

transmitting the specification to a second computer which is configured to maintain a substantially centralized database comprising pricing data;

15 generating estimate data using said second computer in accordance with said specification; and

transmitting said estimate data to said first computer.

20 23. A method of ordering the manufacture of an item as claimed in claim 22, further comprising the step of:

generating a first production order using said first computer in accordance with said specification and said estimate data.

25 24. A method of ordering the manufacture of an item as claimed in claim 23, further comprising the step of:

transmitting said first production order to a third computer at a manufacturing plant.

30 25. A method of ordering the manufacture of an item as claimed in claim 23, further comprising the steps of:

transmitting said first production order to said second computer; and

transmitting said first production order to a third computer at a manufacturing plant.

5 26. A method of ordering the manufacture of an item as claimed in claim 25, wherein said second computer is located at a corporate office, said first computer is located at a sales site remotely located from the corporate office, and further comprising the step of reviewing said first production order at said corporate office.

10 27. A method of ordering the manufacture of an item as claimed in claim 25, further comprising the steps of:

15 reviewing said first production order at said manufacturing plant and fulfilling said first production order if it is determined to be acceptable, and notifying said first computer if said first production order is determined to be unacceptable.

20 28. A method of ordering the manufacture of an item as claimed in claim 22, wherein said step of generating estimate data comprises the step of determining pricing data from at least one table of data stored in a memory device that is accessible by said second computer.

25 29. A method of ordering the manufacture of an item as claimed in claim 28, wherein said step of generating estimate data comprises the step of generating pricing data that is specific to a particular customer with whom a contractual agreement is established by modifying said
30 table in accordance with the terms of the contractual agreement.

30. A method of ordering the manufacture of an item as claimed in claim 29, wherein said table is modified in

5 accordance with at least one data type selected from the group consisting of a price factor, an efficiency factor, a pricing rule, a volume discount, a characteristic of the item to be manufactured in accordance with the contractual agreement, an equipment set-up charge, a run charge and a material upcharge.

10 31. A method of ordering the manufacture of an item as claimed in claim 23, further comprising the steps of:
storing said specification and said estimate data in said memory device; and
generating a second production order that is similar to said first production order by retrieving from said memory device at least part of said specification and said
15 estimate data associated with said first production order.

20 32. A method of ordering the manufacture of an item as claimed in claim 31, wherein said step of generating said second production order is performed by a computer selected from the group consisting of said first computer, said second computer, and a third computer at a manufacturing plant.

25 33. A method of ordering the manufacture of an item as claimed in claim 22, wherein said memory device is associated with said first computer.

30 34. A method of ordering the manufacture of an item as claimed in claim 22, wherein said memory device is associated with said second computer.

35. A method of ordering the manufacture of an item, comprising the steps of:

generating a specification for the item using a first computer, said specification being stored in a memory device and comprising customer order data selected from the group consisting of customer biographical data, credit approval data, item identification data, quantity data, shipping data, handling data, storage data, item usage data, ordering data, planning data, and contract data, and specification data relating to the item to be manufactured;

transmitting the specification to a second computer which is configured to maintain a substantially centralized database comprising pricing data;

generating estimate data using said second computer in accordance with said specification;

transmitting said estimate data to said first computer; and

generating a production order using said first computer in accordance with said specification and said estimate data by retrieving said customer order data and said specification data from said memory device and automatically combining said retrieved data with said estimate data.

36. A method of ordering the manufacture of an item as claimed in claim 35, further comprising the step of:

generating a production order using said first computer in accordance with said specification and said estimate data.

37. A method of ordering the manufacture of an item as claimed in claim 36, further comprising the step of transmitting said production order to a third computer at a manufacturing plant.

38. A method of ordering the manufacture of an item as claimed in claim 36, further comprising the steps of:

transmitting said production order to said second computer; and

transmitting said production order to a third computer at a manufacturing plant.

39. A method of ordering the manufacture of an item as claimed in claim 38, wherein said second computer is located at a corporate office, said first computer is located at a sales site remotely located from the corporate office, and further comprising the step of reviewing said production order at said corporate office.

40. A method of ordering the manufacture of an item as claimed in claim 38, further comprising the steps of:

reviewing said production order at said manufacturing plant and fulfilling said production order if it is determined to be acceptable; and

notifying said first computer if said production order is determined to be unacceptable.

41. A method of ordering the manufacture of an item as claimed in claim 35, wherein said step of generating estimate data comprises the step of determining pricing data from at least one table of data stored in a memory device that is accessible by said second computer.

42. A method of ordering the manufacture of an item as claimed in claim 41, wherein said step of generating estimate data comprises the step of generating pricing data that is specific to a particular customer with whom a contractual agreement is established by modifying said table in accordance with the terms of the contractual agreement.

5 43. A method of ordering the manufacture of an item as claimed in claim 42, wherein said table is modified in accordance with at least one data type selected from the group consisting of a price factor, an efficiency factor, a pricing rule, a volume discount, a characteristic of the item to be manufactured in accordance with the contractual agreement, an equipment set-up charge, a run charge and a material upcharge.

10 44. A method of ordering the manufacture of an item as claimed in claim 36, further comprising the steps of:
storing said specification and said estimate data in a memory device; and
15 generating a second production order that is similar to said first production order by retrieving from the memory device at least part of said specification and said estimate data associated with said first production order.

20 45. A method of ordering the manufacture of an item as claimed in claim 44, wherein said memory device is associated with said first computer.

25 46. A method of ordering the manufacture of an item as claimed in claim 44, wherein said memory device is associated with said third computer.

AMENDED CLAIMS

[received by the International Bureau on 19 July 1996 (19.07.96);
new claims 47-74 added; remaining claims unchanged (9 pages)]

43. A method of ordering the manufacture of an item as claimed in claim 42, wherein said table is modified in accordance with at least one data type selected from the group consisting of a price factor, an efficiency factor, a pricing rule, a volume discount, a characteristic of the item to be manufactured in accordance with the contractual agreement, an equipment set-up charge, a run charge and a material upcharge.

44. A method of ordering the manufacture of an item as claimed in claim 36, further comprising the steps of:

storing said specification and said estimate data in a memory device; and

generating a second production order that is similar to said first production order by retrieving from the memory device at least part of said specification and said estimate data associated with said first production order.

45. A method of ordering the manufacture of an item as claimed in claim 44, wherein said memory device is associated with said first computer.

46. A method of ordering the manufacture of an item as claimed in claim 44, wherein said memory device is associated with said third computer.

47. A system for ordering the manufacture of a product comprising:

a first computer comprising a monitor, a first memory device and an input device for use by an operator initiating an order for the manufacture of said product, said first computer being programmable to generate a plurality of prompts on said monitor for guiding said operator to make at least one of a plurality of choices

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regarding said product using said input device, said plurality of choices comprising which of a plurality of products is to be manufactured, which of a plurality of processes are to be used to manufacture said product and which of a plurality of materials are to be used to manufacture said product, and to generate output signals corresponding to said at least one of a plurality of choices; and

a second computer comprising a second memory device for storing a database, said database comprising data relating to said plurality of products, said plurality of processes and said plurality of materials for generating list price data, said second computer being programmable to receive said output signals from said first computer, to generate estimate data comprising list price for manufacturing said product using said database and said output signals, and to transmit said estimate data to said first computer.

48. An ordering system as claimed in claim 47, wherein said database further comprises price concession data relating to a contractual agreement with a customer, and said second computer is operable to transmit said price concession data to said operator to allow said operator to generate a sell price less than said estimate which corresponds to said price concession data.

49. A system for ordering the manufacture of a product comprising:

a first computer comprising a monitor, a first memory device and an input device for use by an operator initiating an order for the manufacture of said product, said first computer being programmable to generate a plurality of prompts on said monitor for guiding said

operator to make at least one of a plurality of choices regarding said product using said input device, said plurality of choices comprising which of a plurality of products is to be manufactured, which of a plurality of processes are to be used to manufacture said product and which of a plurality of materials are to be used to manufacture said product and to generate a product specification corresponding to said at least one of a plurality of choices, said prompts comprising screens displayed on said monitor having parameters for defining each of said plurality of products, said plurality of products being characterized by respective sets of said parameters, at least two of said sets of parameters being different from one another; and

a second computer comprising a second memory device for storing a database, said database comprising data relating to said plurality of products, said plurality of processes and said plurality of materials for generating an estimate, said second computer being programmable to receive said product specification from said first computer, to generate estimate data for manufacturing said product using said database and said product specification, and to transmit said estimate data to said first computer.

50. An ordering system as claimed in claim 49, wherein said first computer is programmable to generate selected ones of said screens in a selected order depending on said operator's responses to said prompts using said input device.

51. An ordering system as claimed in claim 49, wherein said first computer is programmable to generate a subset of said screens in a selected order depending on which of said

plurality of products said operator selects for manufacture.

5 52. An ordering system as claimed in claim 51, wherein said first computer is programmable to generate selected ones of said subset of screens and not other ones of said subset of said screens depending on said at least one of said plurality of choices.

10 53. An ordering system as claimed in claim 49, wherein said first computer is programmable to generate at least one customer information screen comprising data relating to a customer who has previously ordered the manufacture of a number of said plurality of products, said first memory
15 device being programmable to retrieve product specifications corresponding to said previously ordered products which are stored in said second memory device and identified by unique product specification identifiers, each of said product specifications being characterized by
20 one of said sets of parameters, said first computer being programmed to generate a list of said product specification identifiers on said at least one customer information screen, to process an input signal generated by said input device when said operator selects one of said product
25 specification identifiers, to retrieve said product specification corresponding to said selected product specification identifier, and to display said retrieved product specification on said monitor.

30 54. An ordering system as claimed in claim 53, wherein at least one estimate corresponding to at least one of said product specifications is stored in at least one of said first memory device and said second memory device, and said first computer is programmable to generate an order screen

that requests a number of data relating to said customer and said product selected for manufacture, and to automatically provide at least part of said number of data by retrieving said data from said product specification and said estimate.

55. An ordering system as claimed in claim 49, wherein said first computer is programmable to generate a screen comprising a list of names corresponding to respective ones of said plurality of products, to process input signals generated by said input device when said operator selects one of said plurality of products, and to generate at least one screen comprising said set of parameters corresponding to said selected product.

56. An ordering system as claimed in claim 55, wherein said operator uses said input device to enter parameter data for at least a subset of said set of parameters for said selected product to customize said product, and said first computer is programmable to generate an product specification for said customized product comprising said parameter data.

57. An ordering system as claimed in claim 49, wherein said plurality of products comprises a business form, a label, a mailer, commercial printing, an envelope, a padded product, an add roll, and on-demand reproduction.

58. An ordering system as claimed in claim 57, wherein said set of parameters corresponding to said business form are selected from the group consisting of number of plies, type of paper, size of paper, weight of paper, color of paper, composition on paper, type of ink, color of ink,

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perforation options, hole punching options, packaging options and fastening options.

5 59. An ordering system as claimed in claim 57, wherein said set of parameters corresponding to said label are selected from the group consisting of face type, color, adhesive, label size, liner type, die type and liner size.

10 60. An ordering system as claimed in claim 57, wherein said set of parameters corresponding to said envelope are selected from the group consisting of envelope size, ink color, type of printing, location of printed indicia, inside tint, tint color, barcode printing, return address printing, and postage payor permit data printing.

15 61. An ordering system as claimed in claim 49, wherein said first computer is programmable to generate a predetermined number of screens to prompt said operator to view said parameters and enter parameter data via said input device for selected ones of said parameters as
20 desired, to determine when entry of said parameter data for other ones of said parameters is not necessary, and to prevent said operator from entering said parameter data for said other ones of said parameters.

25 62. An ordering system as claimed in claim 49, wherein said second computer is programmable to validate said product specification by comparing said product specification with validation data stored in said second
30 memory device, said validation data being selected from the group consisting of material code, material type, customer contract data, specification parameters, previously validated product specifications, customer

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identification data, and type of product ordered for manufacture.

5 63. An ordering system as claimed in claim 62, wherein
said second computer is programmable to generate and
transmit a validation signal to said first computer, said
first computer being programmable to generate a prompt to
indicate to said operator that one of said plurality of
choices is improper if said validation signal indicates
10 that said product specification is invalid.

15 64. An ordering system as claimed in claim 49, wherein
first memory device stores at least one of validation data
and validation rules, and said first computer is
programmable to validate said product specification by
comparing said product specification with at least one of
said validation data and said validation rules, said
validation data being selected from the group consisting of
specification parameters, previously validated product
20 specifications, customer identification data, and type of
product ordered for manufacture.

25 65. An ordering system as claimed in claim 64, wherein
said first computer is programmable to generate a prompt to
indicate to said operator that one of said plurality of
choices is improper if said first computer determines said
product specification to be invalid.

30 66. An ordering system as claimed in claim 49, wherein
said first computer is programmable to generate a first
estimate screen comprising estimate screen data selected
from the group consisting of identification of said product
being ordered for manufacture, quantity of said product,
storage data and shipment data.

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5 67. An ordering system as claimed in claim 66, wherein said first computer is programmable to retrieve at least a portion of said estimate screen data and said product specification corresponding to said product specified using said estimate screen from said first memory device, and to transmit said portion of said estimate screen data and said product specification to said second computer.

10 68. An ordering system as claimed in claim 67, wherein said first computer is programmable to generate a second estimate screen displaying said estimate data received from said second computer.

15 69. An ordering system as claimed in claim 68, wherein said estimate data comprises at least one of a list price and a suggested sell price.

20 70. An ordering system as claimed in claim 69, wherein said first computer is programmable to receive another input signal from said input device corresponding to at least one of said estimate screen data, to transmit said input signal to said second computer, and said second computer is programmable to generate and transmit additional estimate data to said first computer comprising
25 at least one of a list price and a suggested sell price.

30 71. An ordering system as claimed in claim 70, wherein said first computer is programmable to generate a third estimate screen displaying at least one of said list price and said suggested sell price from each of said estimate data and said additional estimate data.

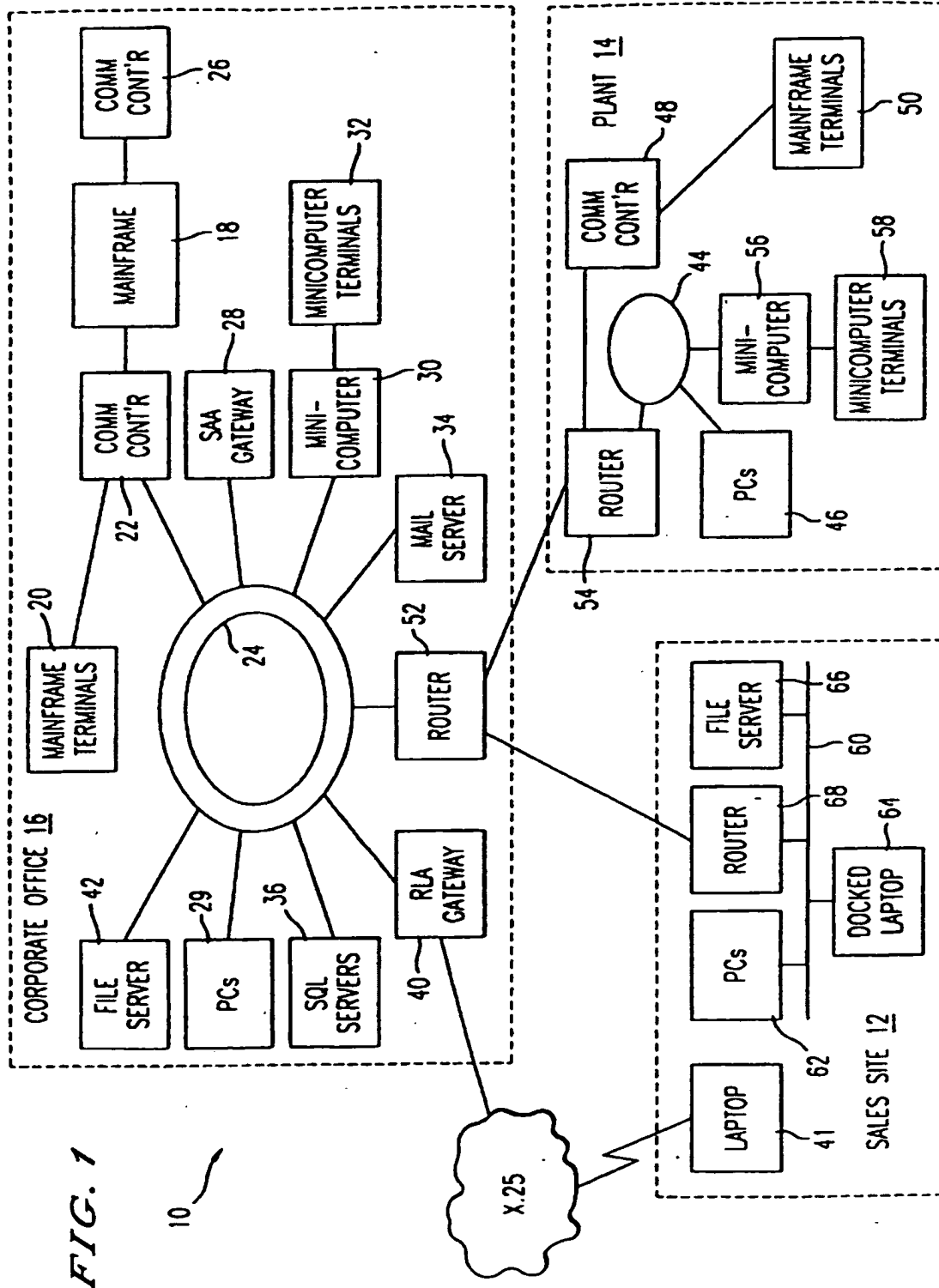
72. An ordering system as claimed in claim 66, wherein said estimate screen data comprises identification of a

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5 plurality of said products and said second computer is programmable to generate said estimate data for each of said plurality of said products, at least one of said estimate data conferring a discount corresponding to the number of said plurality of said products being ordered.

10 73. An ordering system as claimed in claim 66, wherein said second computer is programmable to validate said estimate data if said estimate data satisfies at least one criterion selected from a group of criteria consisting of estimate data relating to a selected one of said plurality of materials, estimate data for a quantity of said product which exceeds a predetermined number, estimate data exceeding a selected monetary value, and estimate data for
15 a selected customer.

20 74. An ordering system as claimed in claim 66, wherein said first computer is programmable to generate an order screen comprising a plurality of order data selected from the group consisting of indicia for identifying said product specification, customer information, indicia for identifying said estimate corresponding to said product specification, list prices and suggested sell prices, and to retrieve at least part of said order data from said
25 product specification and said estimate data.



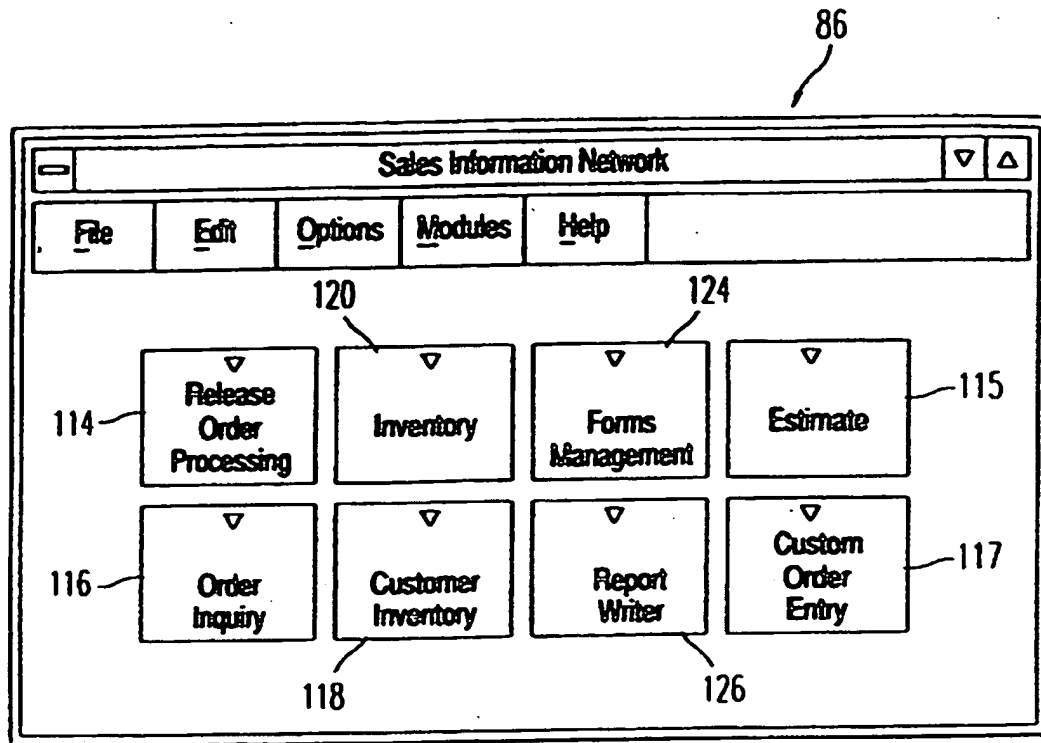
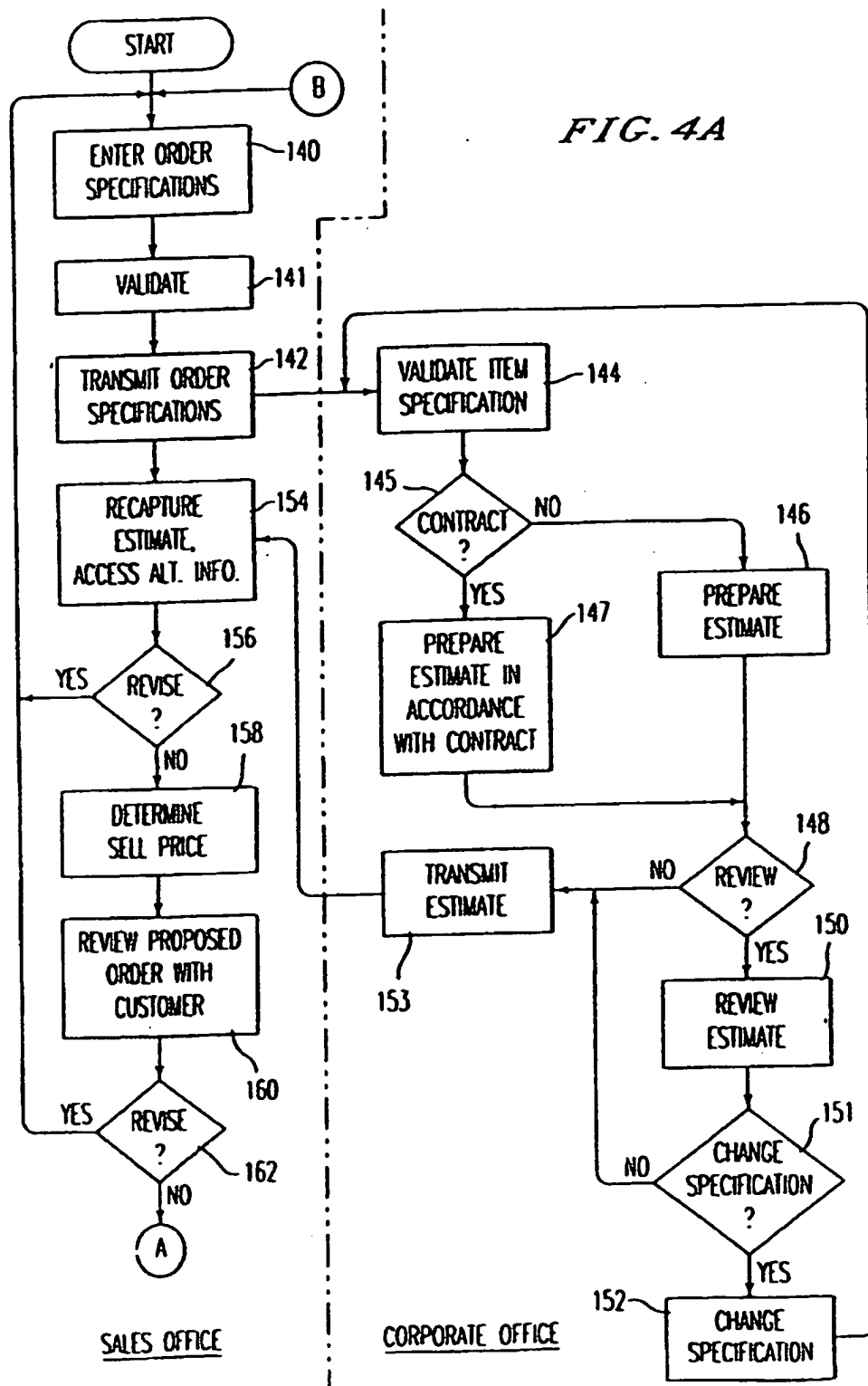
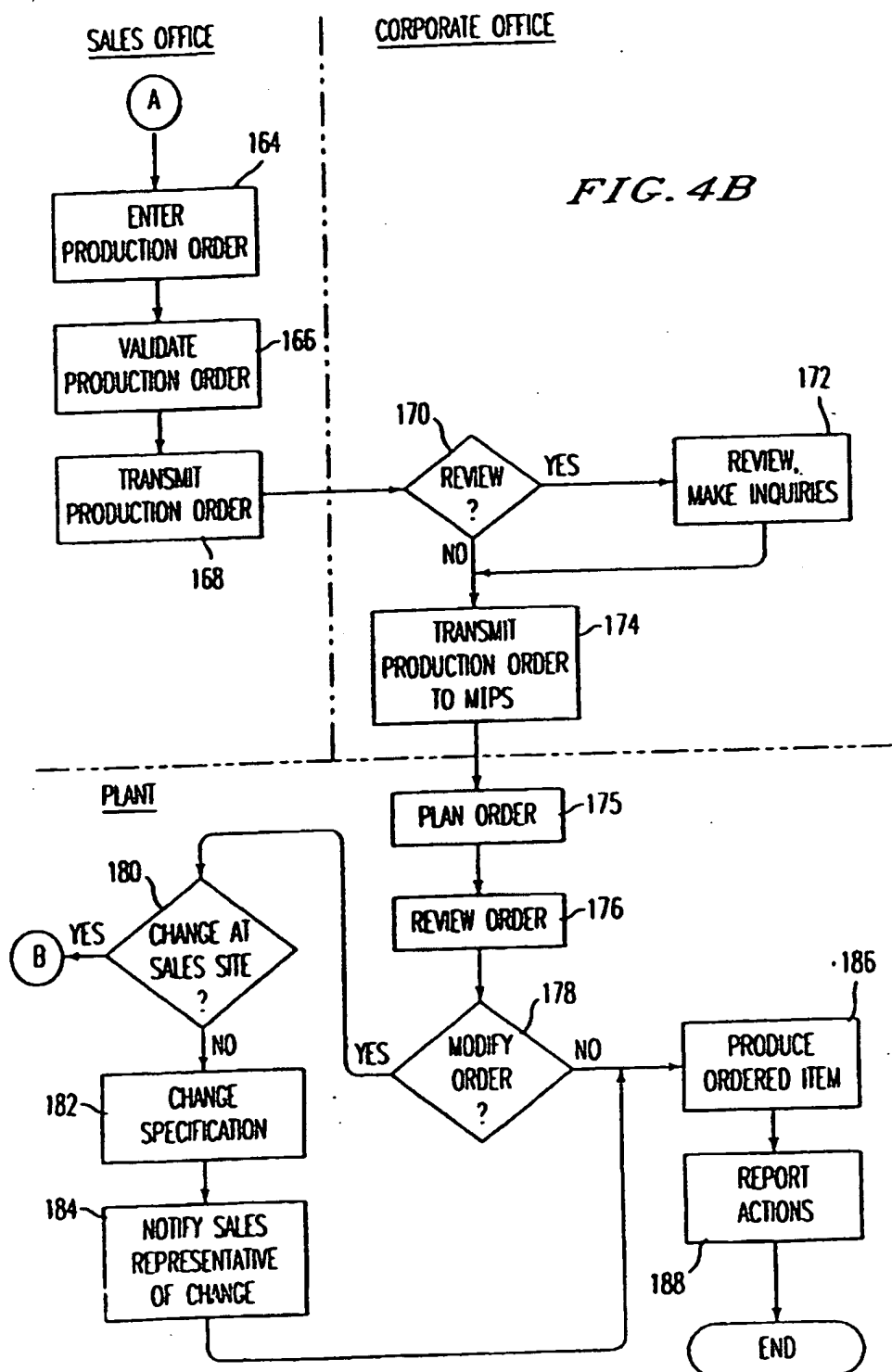
*FIG. 3*

FIG. 4A





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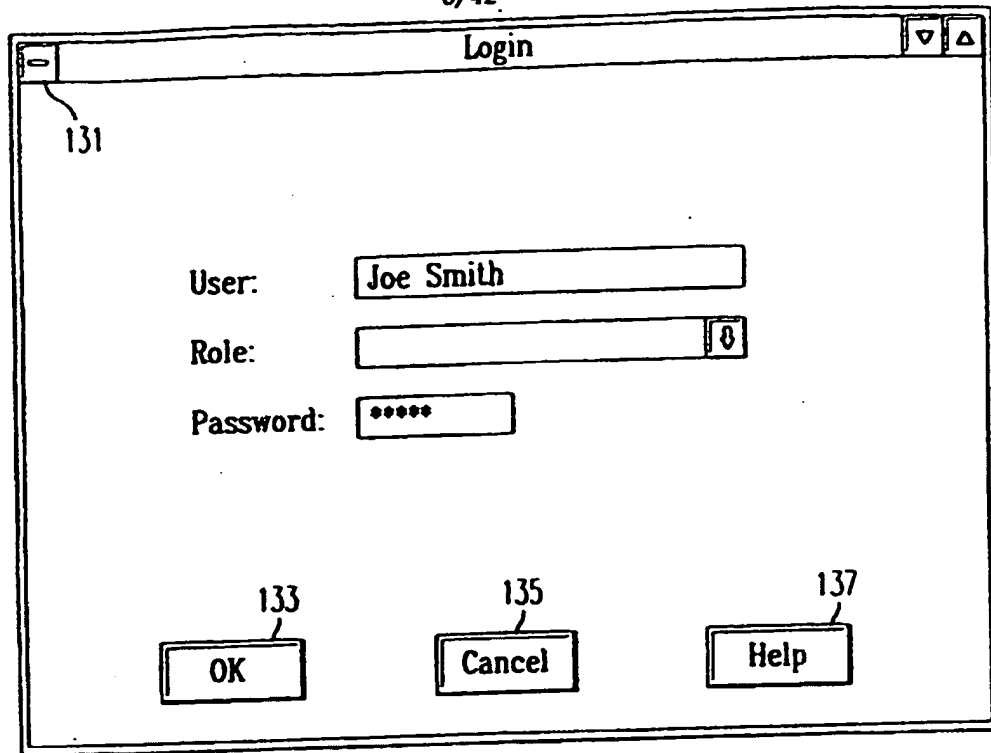


FIG. 5

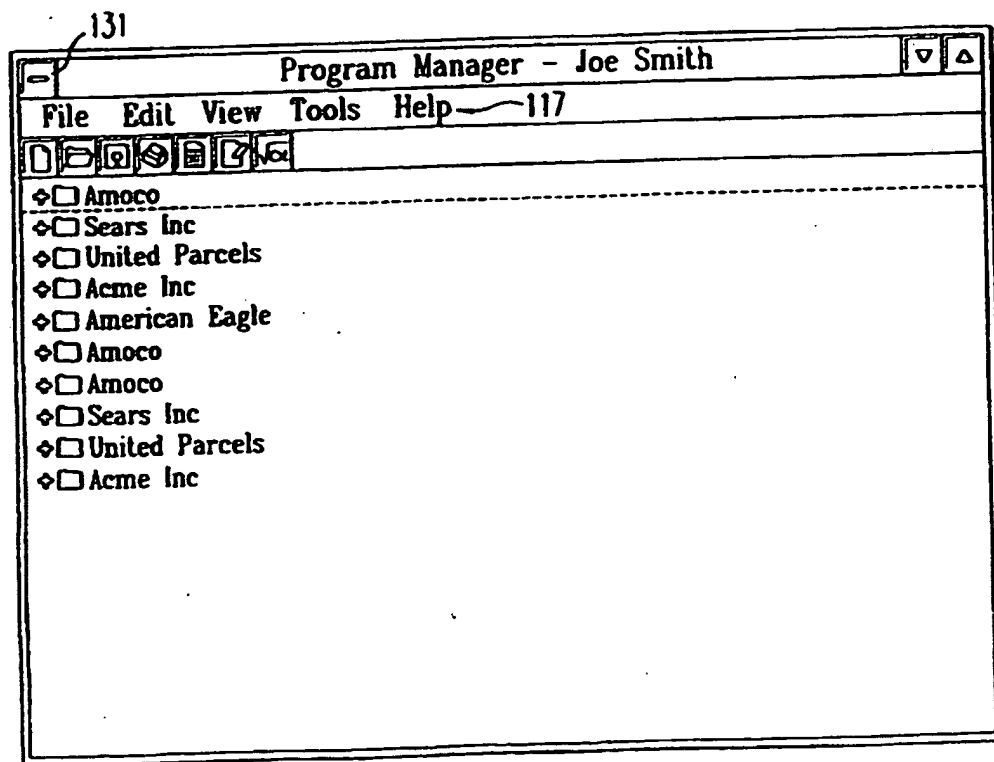


FIG. 6

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FIG. 7 is a screenshot of a software dialog box titled "Account Information". The dialog box has a standard Windows-style title bar with a minimize button, a maximize button, and a close button. The main content area contains several input fields and labels. At the top, there are three input fields: "Prospect Number:" with the value "2373419", "Account Number:" with the value "98-45231-678934", and "Account Name:" with the value "Acme Inc.". Below these, there are two columns of input fields. The left column is labeled "Sold To" and contains fields for "Address 1:" (7136 Wisper Cl.), "Address 2:" (Suite 420), "City:" (Jasper), "State:" (Texas), and "Zip:" (51237 - 3124). The right column is labeled "Ship To" and contains fields for "Address 1:" (7136 Wisper Cl.), "Address 2:" (Suite 420), "City:" (Jasper), "State:" (Texas), and "Zip:" (51237 - 3124). Below these columns, there is an "Attn:" label followed by an input field containing "John Doe". At the bottom of the dialog box, there are three buttons: "OK", "Cancel", and "Help". Each button has a small number above it: "133" above "OK", "135" above "Cancel", and "137" above "Help".

FIG. 7

FIG. 8 is a screenshot of a software dialog box titled "Search". The dialog box has a standard Windows-style title bar with a minimize button, a maximize button, and a close button. The main content area contains a "Search" button and an input field with the text "Item 123456". Below these, there is a section labeled "Search In" with several checkboxes. The checkboxes are arranged in two columns. The left column contains: "Specification", "Proposals", "Estimates", "Match Case", and "Find Whole Words". The right column contains: "Production Orders", "Search All", "Use Pattern to Match", and "Sounds Like". At the bottom of the dialog box, there are three buttons: "OK", "Cancel", and "Help". Each button has a small number above it: "133" above "OK", "135" above "Cancel", and "137" above "Help".

FIG. 8

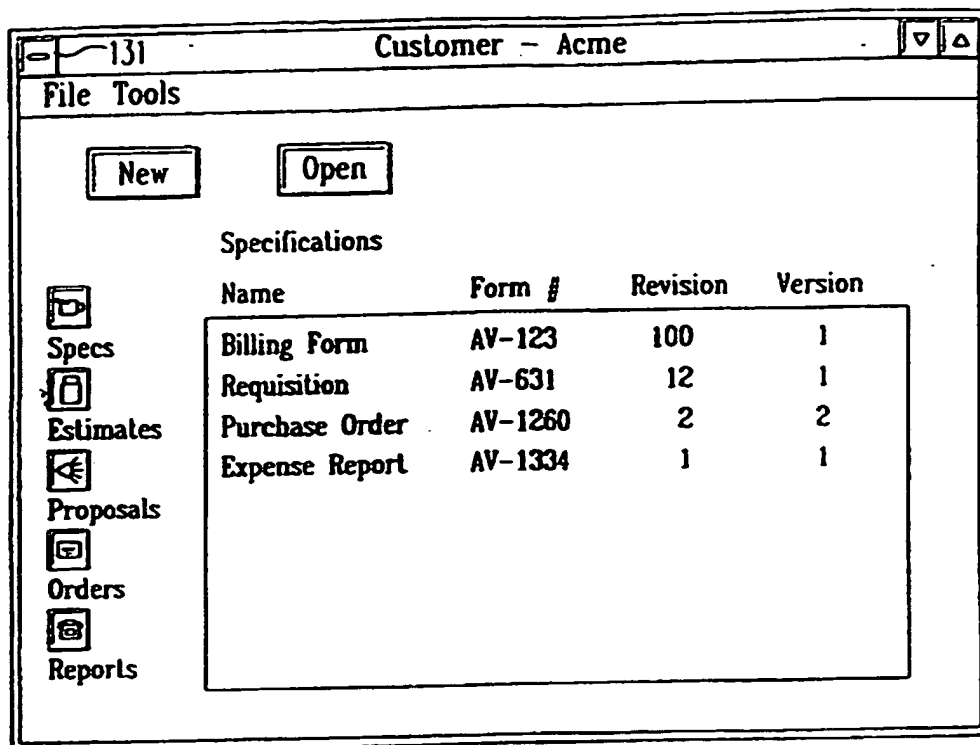


FIG. 9

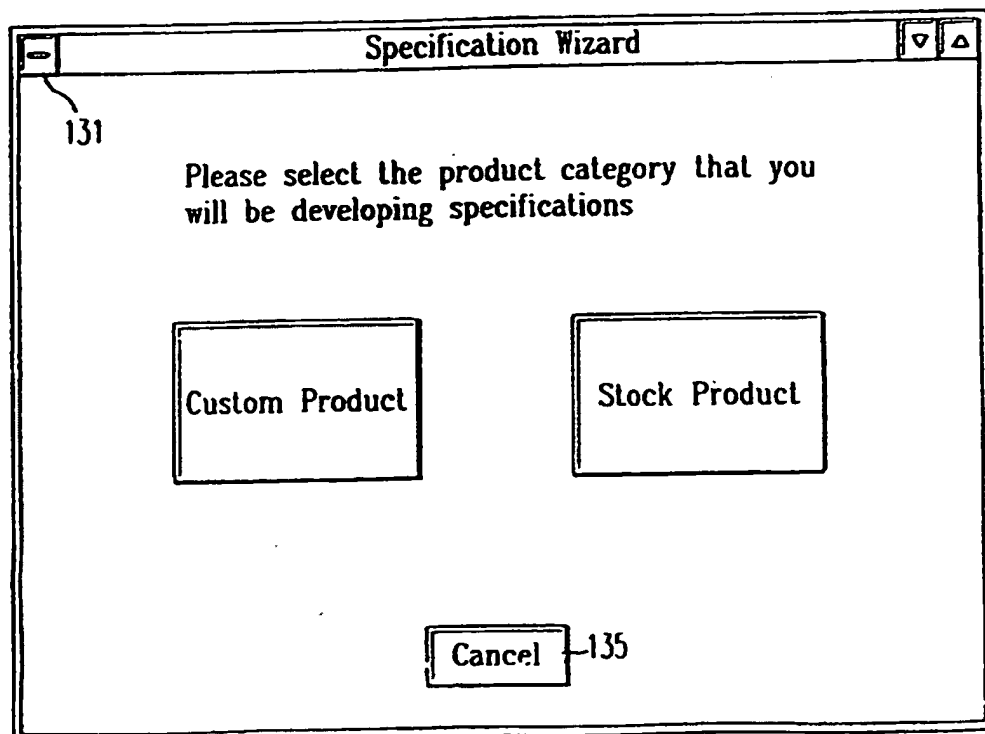
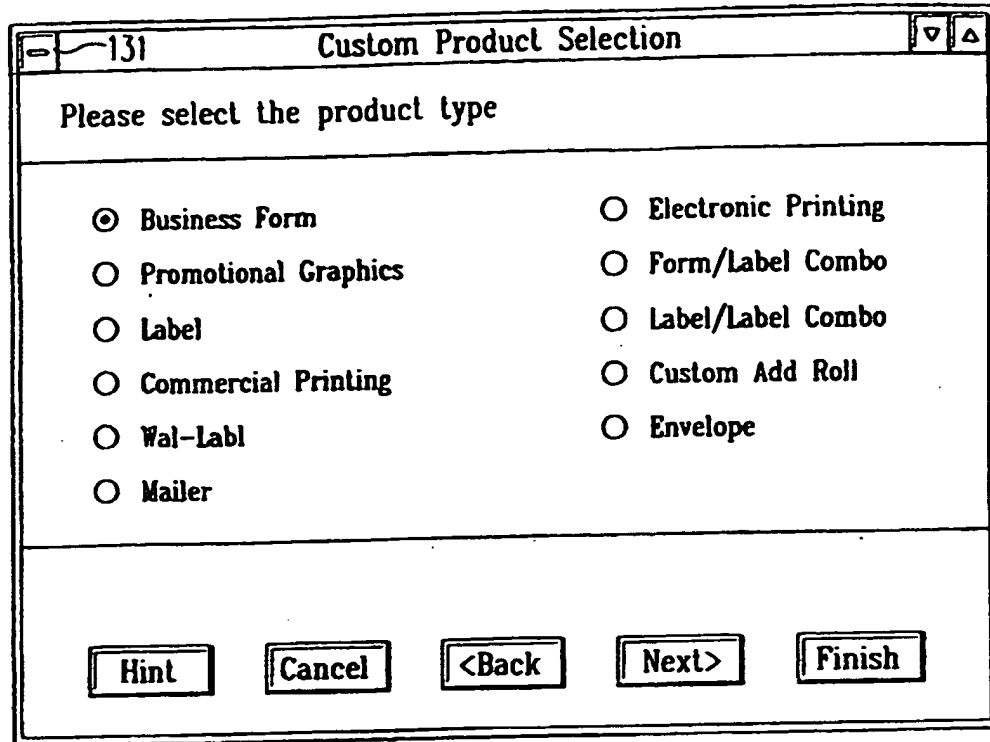


FIG. 10



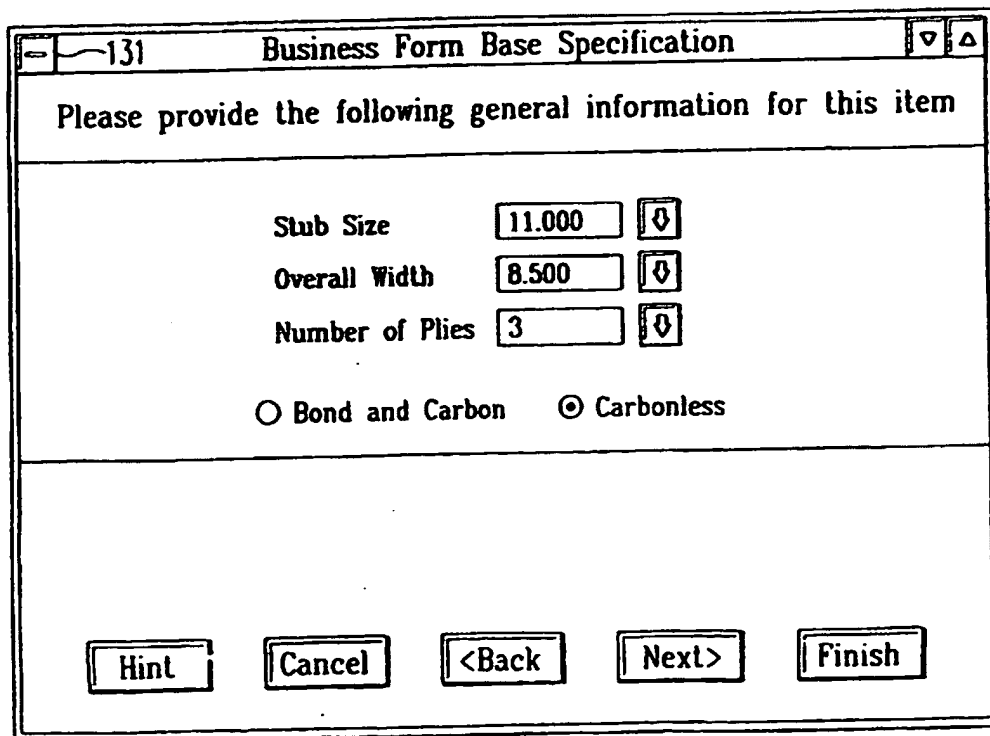
131 Custom Product Selection

Please select the product type

<input checked="" type="radio"/> Business Form	<input type="radio"/> Electronic Printing
<input type="radio"/> Promotional Graphics	<input type="radio"/> Form/Label Combo
<input type="radio"/> Label	<input type="radio"/> Label/Label Combo
<input type="radio"/> Commercial Printing	<input type="radio"/> Custom Add Roll
<input type="radio"/> Wal-Label	<input type="radio"/> Envelope
<input type="radio"/> Mailer	

Hint Cancel <Back Next> Finish

FIG. 11



131 Business Form Base Specification

Please provide the following general information for this item

Stub Size	11.000	↑ ↓
Overall Width	8.500	↑ ↓
Number of Plies	3	↑ ↓

☐ Bond and Carbon ☒ Carbonless

Hint Cancel <Back Next> Finish

FIG. 12

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Business Form Base Specification

131 These are all the questions you need to answer to generate your base product specification!

Please provide the following information:

Customer Item Name
Invoice

Customer Item Number Revision Number
123456 1.0

Hint Cancel <Back Next> Finish

FIG. 13

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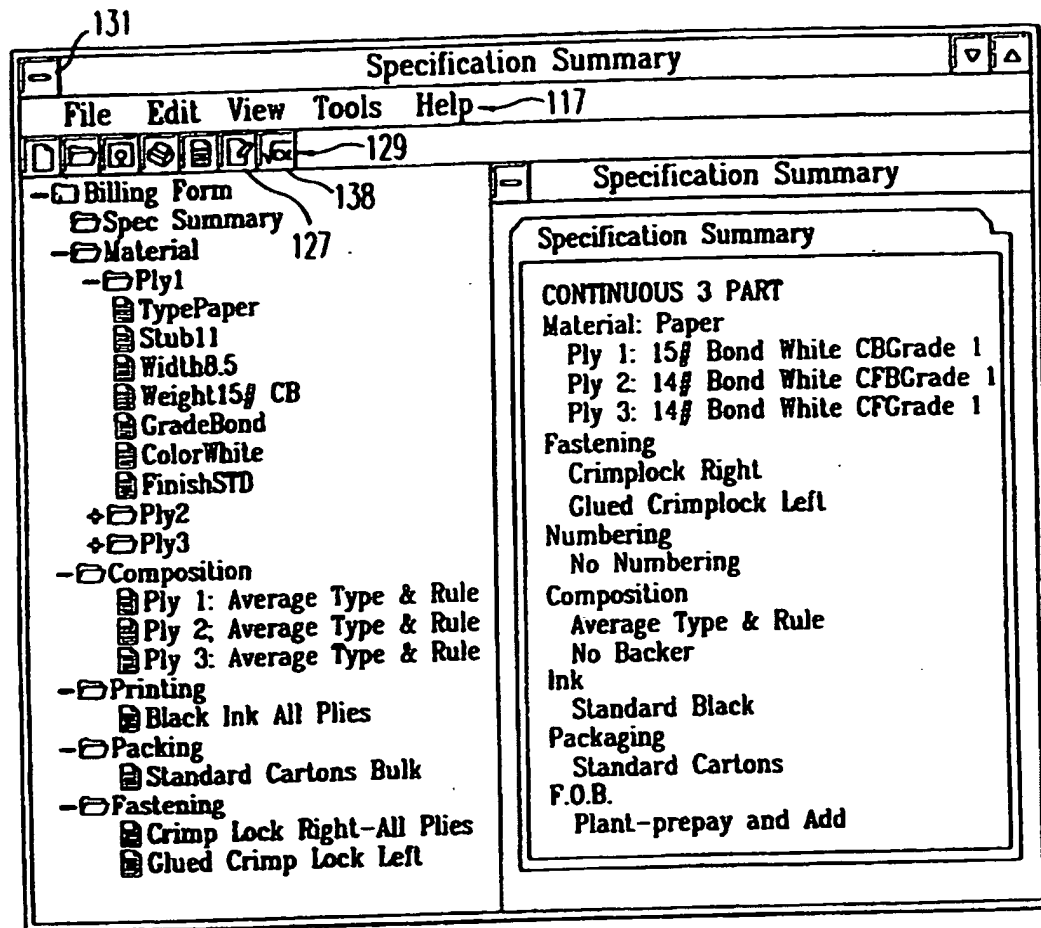


FIG. 14

131 **Material Base Specification**

Please review the material specifications for accuracy.
You should modify these specifications now if they are incorrect.

Type 119

Ply	1	2	3		
Type	Paper	Paper	Paper		
Stub	11	11	11		
Width	8.5	8.5	8.5		
Weight	15#	14#	14#		
Grade	CB	CFB	CF		
Color	White	White	White		
Finish	STD	STD	STD		

What do you want to do next?

☒ Review and Edit Features ☐ Add Another Item

FIG. 15

131 **Material: Paper/Carbon**

Paper

Vendor

Paper

To Ply	1	2	3
From Ply	1	2	3
Base Wt	15#	14#	14#
Grade	CB	CFB	CF
Color	White	White	White
Finish			
Vendor			

121

133 135 137

FIG. 16
SUBSTITUTE SHEET (RULE 26)

131 Material: Paper/Carbon

Paper Carbon

Type

Carbon

Width			
Grade			
Color			
Type			

OK 133 Cancel 135 Help 137

FIG. 17

131 Composition Simple 123

Composition Simple Composition Detail

Composition

☒ Face Composition ☒ Average ☐ Light ☐ Heavy ☐ Blank

☐ Backer ☐ None ☐ Average ☐ Heavy

☐ Screens

☐ Reverses

☒ Color ☒ 1 Color ☐ 2 Color ☐ 3 Color

Composition Changes

☐ Base Composition Changes Total Changes Ply to Ply

☐ Backer Changes Total Changes Ply to Ply

☐ Multi-Color Changes 2nd Color

3rd Color

OK 133 Cancel 135 Help 137

FIG. 18

131 Composition Detail

Composition Detail

Construction. 0

Construction Type	Ply	Ply	
Sequence			
From Ply	1	1	
To Ply	3	3	
Number of	1	1	
Side	Front	Back	
Color Number	Black	Black	
Coverage	Average	Average	
Composition Feature	0	0	
Composition Change	0	0	

OK 133 Cancel 135 Help 137

FIG. 19

131 Fastening

Fastening Simple Fastening Detail 125

Types of Fastening

- ☐ Unit Set-All Plies Glued
- ☒ Crimp Left/Right-All
- ☐ Glue and Wal-Lock
- ☐ Wal Flex I
- ☐ Wal Flex II

Location of Fastening

- ☐ Left
- ☐ Right
- ☒ Both

OK 133 Cancel 135 Help 137

FIG. 20

131 Fastening And Pocket Detail

Fastening/Pocket Simple Fastening/Pocket Detail

Number		
Type	Crimplock	Glued Crimplock
Location	Right	Left
Pocket Opening		
From Ply	1	1
To Ply	3	3
From Carbon		
To Carbon		

Preview Fastening

OK 133 Cancel 135 Help 137

FIG. 21

131 Label Material

Label Material

Label Ply	2
Material Code	5715
Face Stock	200
Color	Red
Adhesive	Perm
Label Depth	3/4
Label Width	5
Liner Stock	300
Color	Red
Adhesive	Perm
Label Depth	3/4
Label Width	5
Number Wide	300
Liner Stock	2
Liner Width	3/4

OK 133 Cancel 135 Help 137

FIG. 22

131 Ink Detail

Ink Detail

Ply	2	2
Side	Face	Face
Color	Black	Black
Ink Type	Std	Std

OK 133 Cancel 135 Help 137

FIG. 23

SUBSTITUTE SHEET (RULE 26)

131

Punch/Drill/Perf Punch/Drill/Perf-Detail

File Hole Punching/Drilling

Machine: ☒ Press ☐ Collator ☐ Drill

Style: ☒ Binder ☐ Automotive

Holes: ☐ None ☐ 1 ☐ 2 ☒ 3

Hole Size: ☒ 9/32 ☐ 13/32 ☐ 1/2 ☐ 3/8

Orientation: ☒ Horizontal ☐ Vertical

Center To Center:

Paper Perforations

☐ Full Horizontal ☐ None ☐ 1 ☐ 2

☒ Full Vertical ☐ None ☒ 1 ☐ 2

OK 133 Cancel 135 Help 137

FIG. 24

131

Punch/Drill/Perf

Punch/Drill/Perf-Detail

Punch/Perf

Punch

Punch/Perf	Punch		
Style	Binder		
Number of	3		
Size	9/32		
From Ply	1		
To Ply	3		
Location	Left		
Spacing	2-1/4		
Machine	Press		
Paper Only	Yes		

OK 133 Cancel 135 Help 137

FIG. 25

131

Envelope Construction

Envelope Construction

Envelope

Envelope Type				↑
Construction Type				
Stock Item #				
Paper Type				
Paper Weight				
Envelope Height				↓
Envelope Width				↔

Window Specification

Window Type				↑
Window Height				
Window Width				
From Left Edge				↓
From Bottom Edge				↔

OK 133 Cancel 135 Help 137

FIG. 26

131

Envelope Composition

Ink & Printing

Number of Colors Coverage

☐ 1 Side ☐ 2 Sides

☐ Front ☐ Print on Flap

☐ Back ☐ Inside Flap

☐ Below Flap

Inside Tint

☐ Std Flake ☐ Tint Color

☐ Special Pattern

☐ Process Blue ☐ 185 Red

☐ 347 Green ☐ 463 Brown

☐ Warm Red

☐ Match PMS #

Artwork

☐ CRC ☐ SetType

Number of Printed Lines

☐ Close Registration on Colors

☐ Edge Bleeds Qty

Texture

☐ Flat ☐ Raised

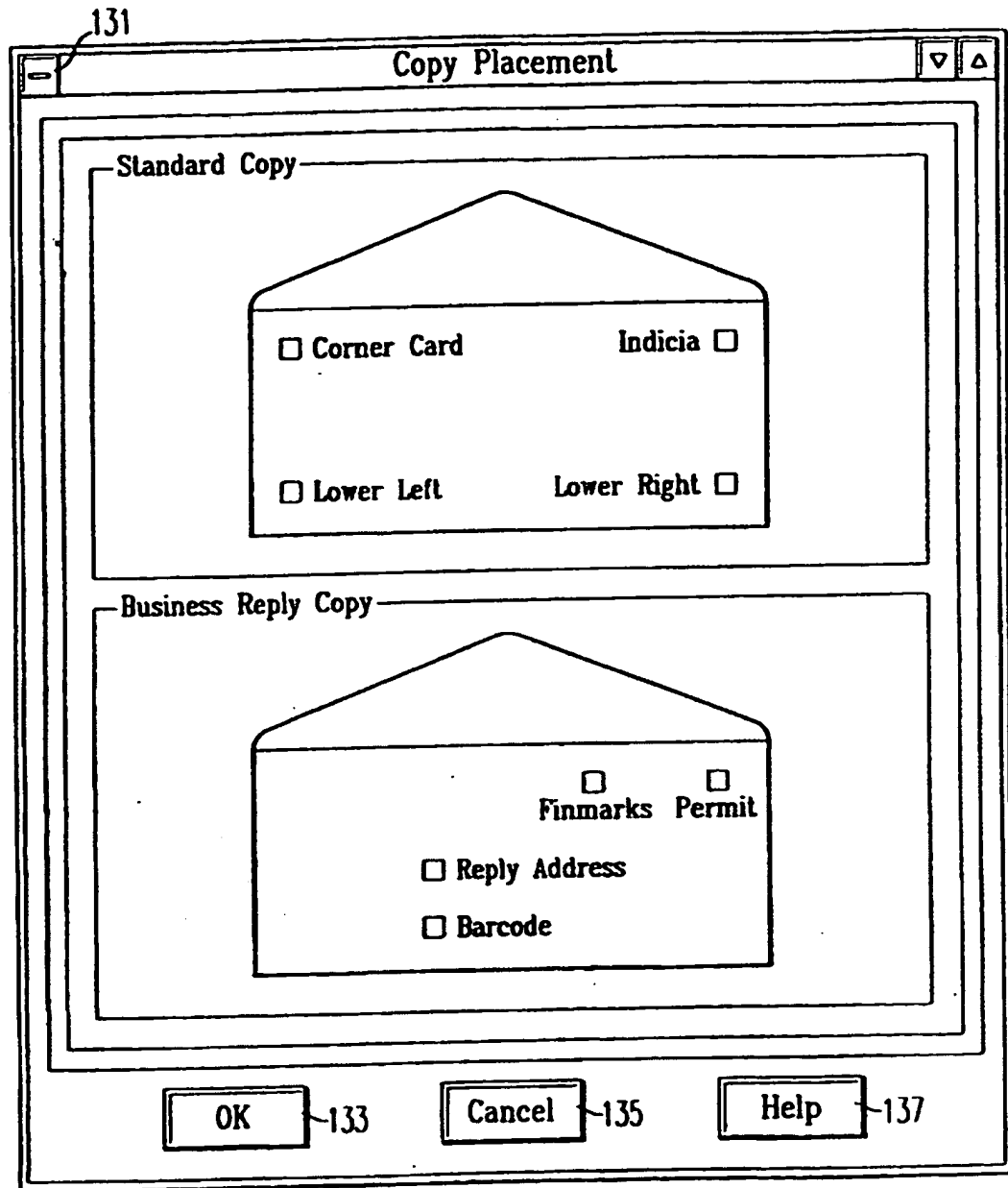
☐ Unprinted

Printing

☐ Flexo ☐ Litho

133 135 137

FIG. 27

*FIG. 28*

131

Roll Specification

Roll Specification

Qty per Roll: 44000

Caliper:

Standard Weight:

Core ID: 3

Core OD: 3.5

Roll Diameter: 40

Core Material: Paper

Roll Length: 40000

Item Orientation

☐ Outside Wound

☐ Inside Wound

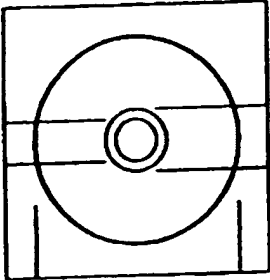
Delivery of Printed Copy

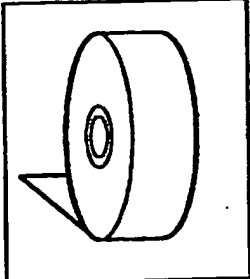
☐ Top

☐ Bottom

☐ Right

☐ Left





OK 133 Cancel 135 Help 137

FIG. 29

131

Define Specifications: Electronic Printing

Sheet Size: 8 1/2 x 11

Paper: 20# Bond - 81 Brightness

Print On: ☒ Front ☐ Front and Back

Punching: Std 3 Hole

☒ Trim ☒ Polywrap

Trim Size: 8 x 10

☐ Sheets per Wrap

☐ Sets/Pads per Wrap 10

☒ Collate ☒ Fasten

Number of Sheets 50

Number of Sets 10

☐ Staple

Number of Sheets 50

Number of Sets 10

☐ Pad

Sheets per Pad

OK 133 Cancel 135 Help 137

FIG. 30

131 Electronic Printing

Electronic Printing Detail

Construction Type:

Body

Cover

Construction Type	
Printed Sides	
Number of Sheets	
Type of Stock	
Color of Stock	
Weight of Stock	
Finished Size Height	
Finished Size Width	
Cover Printing Option	

OK 133 Cancel 135 Help 137

FIG. 31

131 Estimate Header - Customer

Estimate Request Header

Contract Number: Combination: 1 of 1

F.O.B. Point: ☒ Plant ☐ Destination

Enter Zip Code: ☐ Inside Delivery

Customer Item #	Revision	Description	Quantity	Quantity UOM
123456	1	Invoice	1	
AV-631	12	Requisition	1	
AV-1260	2	Purchase Order	2	
AV-1334	1	Expense Report	1	

OK Cancel Help Alternate Specs...

FIG. 32

131 Estimate Detail

Estimate Detail

Customer Item Name Invoice

Customer Item Number	123456
Customer Item Name	Invoice
Customer Revision Number	1
Quantity	10
Quantity UOM	k
Overrun %	5%
Previous List #	ES3084-392
Previous Job #	84-545-40
Job Type	Job Lot Stock
# of Prints	3
Months Storage	4 Months
# of Shipments	3
Paid For Stock	Yes

OK 133 Cancel 135 Help 137

FIG. 33

131

List Price Recap

List Price Recap

Quantity	10000		
Flat per M	11		
Run per M	37.93		
List per M	38.04		New
Storage	.76		
Freight	2.56		
Other	0.00		
Total List	41.36		
Flat per M	.09		
Run per M	37.93		
List per M	38.02		Repeat
Storage	.76		
Freight	2.56		
Other	0.00		
Total List	41.34		

OK 133 Cancel 135 Help 137

FIG. 34

131

Sell Price Calculator

Sell Price Calculator

Description

Estimate #	RX-234-45612
Item #	123456
Revision #	1
Version	
Description	Invoice
UOM	thousand
Quantity	10
In Combination	No
List Price	41.36
Minimum Sell	35.00
Sell UOM	thousand
Concession	15%
Sell Price	35.16

OK 133 Cancel 135 Help 137

FIG. 35

131

Forms Usage - Reading & Writing Methods

Writing Methods **Reading Methods**

☐ Manual

☐ Pencil ☐ Ball Point From Ply # To Ply #

☐ Machine

Machine Spacing

Horizontal (Across) per " Vertical (Down) per "

Machine Type

☐ Typewriter
☐ Card Imprint
☐ Printer

Printer Information

☐ Front Feed ☐ Rear Feed

MFG

Model

IPM

From Ply # To Ply #

Writing Sequence

Seq 1 From Ply # To Ply #

Seq 2 From Ply # To Ply #

Seq 3 From Ply # To Ply #

OK 133 **Cancel** 135 **Help** 137

FIG. 36

131 Forms Usage - Reading & Writing Methods

Writing Methods Reading Methods

☐ OMR MFG Model

☐ OCR MFG Model

☐ Bar Code Type

☐ MICR ☐ Layout Enclosed

OK 133 Cancel 135 Help 137

FIG. 37

FIG. 38

131 Forms Usage - Continuous Forms

Continuous Forms Unit Set Forms Usage

Deleaving

☐ Manual Unit Set

☐ Power All Plies-One Pass

Set Separation

☐ None

☐ Manual

☐ Power Single Ply

Stub Removal

☐ None

☐ Manual

☐ Power Trim

On Deleaver

Specification /Explanation:

After Handling Equipment

	Mfg	Model	
Deleaver/Collator	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Margin Trimmer
	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Margin Trimmer
Burstler	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Center Slitter
	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Center Slitter

OK 133 Cancel 135 Help 137

131

Forms Usage - Continuous Forms

Continuous Forms Unit Set Forms Usage

Unit Set Forms

	All Plies at Once	Section	Other Explanation
<input type="checkbox"/> Single Stub	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/> Double Stub	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/> Book Bound	<input type="checkbox"/>	<input type="checkbox"/>	

OK 133 Cancel 135 Help 137

FIG. 39

131

Forms Usage - Continuous Forms

Continuous Forms Unit Set Forms Usage

Form Separation

<input type="radio"/> Unit Set	<input type="radio"/> Reading Methods
<input type="radio"/> Continuous	<input type="radio"/> Writing Methods
Specifications	Specifications

Registration Requirements

<input type="checkbox"/> Window Envelope	<input type="checkbox"/> Another Form
--	---------------------------------------

OK 133 Cancel 135 Help 137

FIG. 40

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Sales Order Header

Order Header

Customer Account:	AC-1234-704327034	Order Date:	11/29/94
Sales Order #:	AC-7723-660932123	Requested Ship Date:	12/29/94
Sales Rep #:	WCS 23456	Contract #:	BZ-34212-453219
Sales Rep Name:	Joe Smith	Tax Code:	Taxable
Sales Office #:	Chicago	Customer P.O.#:	GFE-23-987623-21

Order Type

☒ Production ☐ Release Items and Stock Items

Sold To	Ship To
AVIS	AVIS
1234 Any Street	1234 Any Street
Mytown, U.S.A. 16111	Mytown, U.S.A. 16111

OK 133 Cancel 135 Help 137

FIG. 41

131 Production Order Detail

Production Detail

Proposal # Plant:

Estimate #

Customer Item #	123456	
Item Class	Repeal	
Quantity	10000	
Overrun %	5%	
List Price	41.36	
Sell Price	35.16	
Concession	15%	

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FIG. 42

FIG. 43

131 Marginal Words

Marginal Words

Label1

Ply Number		
Marginal		
Location		
Color		
Plant Option		

133 135 137

131

Concession Approval

Customer Name: Sales Order #:

Sales Rep: Approval Form #:

District: Plant:

Date: Requested Ship Date:

<table border="1" style="width: 100%;"> <tr><td>Customer Item #</td><td>123456</td></tr> <tr><td>Quantity</td><td>10000</td></tr> <tr><td>Length</td><td>8.5</td></tr> <tr><td>Width</td><td>11</td></tr> <tr><td># of Parts</td><td>3</td></tr> <tr><td>List Price</td><td>41.36</td></tr> <tr><td>Selling Price</td><td>35.16</td></tr> <tr><td>Conc %</td><td>15%</td></tr> <tr><td>Prev Quantity</td><td>N/A</td></tr> <tr><td>Prev Conc</td><td>N/A</td></tr> </table>	Customer Item #	123456	Quantity	10000	Length	8.5	Width	11	# of Parts	3	List Price	41.36	Selling Price	35.16	Conc %	15%	Prev Quantity	N/A	Prev Conc	N/A	<p>Special Materials/Features</p> <div style="border: 1px solid black; height: 80px; width: 100%;"></div> <p>Reasons For Concession</p> <div style="border: 1px solid black; height: 80px; width: 100%;"></div>
Customer Item #	123456																				
Quantity	10000																				
Length	8.5																				
Width	11																				
# of Parts	3																				
List Price	41.36																				
Selling Price	35.16																				
Conc %	15%																				
Prev Quantity	N/A																				
Prev Conc	N/A																				

% Concession ☐ Approved By:
☐ Not Approved

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FIG. 44

EP601CC		PAGE 1
MATRIX PRICING - CONTRACT SET-UP		
ACTION	(I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST) ~252	
KEY		
CONTRACT SCHEDULE	20003	
PROD TYPE	CC	
ARGUMENT	COOPER	
CUSTOMER NAME	00001	
STANDARD CONTRACT SCHEDULE	N	(N OR R)
NEW/REPEAT		(D OR SPACE)
DELETE FLAG		
NEXT TRANSACTION		
PF1=MENU PA1=FRWRD PF4=NEXT SCREEN PF7=PRINT SCHEDULE ~254		

FIG. 45

EP602CC		PAGE 1
MATRIX PRICING - FORM WIDTHS		
ACTION	(I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST)	252
KEY	CONTRACT SCHEDULE	20003
	PRODUCT TYPE	CC
	STUB LENGTH	11.0000
ARGUMENT		
DESCRIPTION		
WIDTHS		
	CUSTOM CONTINUOUS	
	8.500	9.875
	10.625	12.000
	14.875	
PF1=MENU PA1=FRWRD PF4=NEXT SCREEN PF7=PRINT SCHEDULE		254

FIG. 46

EP603CC		PAGE 1	
MATRIX PRICING - COMPOSITION			
ACTION	(I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST) 252		
KEY			
CONTRACT SCHEDULE	20003	PRICE FACTOR	1.000
STUB LENGTH	11.000	EFF. FACTOR	1.000
PROD TYPE	CC		
PLY	1		
ARGUMENT			
BASE COMP CHG:	STD.	EXCP.	PRC FCTR
	230.00	230.00	1.000
COMPOSITION RULE SELECTION:			
RULE			
-	01N01A	136.38	136.38
-	01P07A	185.37	185.37
REMARKS			
PF1=MENIJ PA1=FRWD PF2=RETURN PF4=NEXT SCREEN PF5=PRIOR SCREEN 254			

FIG. 47

EP611CC		SELECT SUBRULES FOR MATRIX SCHEDULE:	2003 - CC	PAGE 1
RULE NO.	DESCRIPTION			
01A	BASE COMPOSITION			
01B	SIMPLE COMPOSITION			
01B01A	SIMPLE COMPOSITION CHARGE (SEE NOTE)			
01C	HEAVY COMPOSITION			
01C01A	HVY COMP CHARGE PER OCCURRENCE F OR B			
01E	SPECIAL COMPOSITION (SEE NOTE)			
01E01	1. SCREENS AND/OR PHANTOMS			
01E01A	ORIGINAL SCREEN CHARGE			
01E01B	SCREEN CHANGES, CHARGE			
01E01D	SCREEN IN SAME COLOR AS THE SOLID, REVERSE OR B/O			
01E02	CROSS-HATCHING			
01E02A	CROSS-HATCHING--ORIGINAL CHARGE			
01E02B	CROSS-HATCHING--CHANGES, CHARGE (SEE NOTE)			
01E03	REVERSED TYPE, LOGOS AND SOLIDS			
01E03A	REVERSES, LOGOS & SOLIDS, ORIGINAL CHARGE			
01E03B	REVERSES ETC. CHANGES, CHARGE			
01E03D	REV. ETC. IN SAME COLOR AS SCREEN, CHARGE			
PFI=RETURN TO EP603CC PA1=PAGE FORWARD PA2=FIRST PAGE				254

FIG. 48

EP604CC

MATRIX PRICING - SET-UP

(I)=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST)

KEY CONTRACT SCHEDULE 20003 PRICE FACTOR 1.000

STUB LENGTH 11.000 EFF. FACTOR 1.000

PROD TYPE CC

PLY 1

ARGUMENT

BASE SETUP CHG: STD. EXCP. PRC FCTR EFF FCTR

495.00 495.00 1.000 1.000

SET-UP RULE SELECTION:

RULE	STD.	EXCP.	PRC FCTR	EFF FCTR	REMARKS
- 05C01A	8.40	8.40	.000	.000	
- 15B01A	0.00	0.00	.000	.000	
- 17A01A	0.00	0.00	.000	.000	

PF1=MENU PA1=FRWD PF2=RETURN PF4=NEXT SCREEN PF5=PRIOR SCREEN

PAGE 1

252

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FIG. 49

EP605CC		MATRIX PRICING - RUN CHARGES				PAGE 1
ACTION		(I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST)				252
KEY						
CONTRACT SCHEDULE		20003	PRICE FACTOR	1.000		
STUB LENGTH		11.000	EFF. FACTOR	1.000		
PROD TYPE		CC				
PLY NUMBER		1				
ARGUMENT						
OPPOSITE DIMENSIONS:						
WIDTH	STD. CHG.	EXCP. CHG.	PRC. FCTR.	EFF. FCTR.	STD. CHG.	EXCP. CHG.
8.500	19.95	19.95	1.000	1.000		
9.875	21.95	21.95	1.000	1.000		
10.625	23.05	23.05	1.000	1.000		
12.000	25.05	25.05	1.000	1.000		
14.875	29.25	29.25	1.000	1.000		
PF1=MENU PA1=FRWD PF2=RETURN PF4=NEXT SCRN PF5=PRIOR SCRN PF6=ADDL WIDTHS						

254

FIG. 50

MATRIX PRICING - ADD'L CHARGES										PAGE 1	
ACTION (I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST) ~ 252											
KEY CONTRACT SCHEDULE 20003 PRICE FACTOR 1.000											
PROD TYPE CC 11.0000 EFF. FACTOR 1.000											
STUB LENGTH .000 QUANTITY .00											
WIDTH .000											
ARGUMENT											
OPPOSITE DIMENSIONS:											
RULES		FLAT		FLAT		EFF.		EFF.		REMARKS	
STD.		EXCP.		STD.		EXCP.		FCTR.			
06D01A		81.46		81.46		1.000		1.000			
05F02C		.00		.00		1.000		1.000			
				5.25		5.25		5.25			
PF1=MENU PA1=FRWD PF2=RETURN PF4=NEXT SCR N PF5=PRIOR SCR N PF6=PAGE FRWD											

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FIG. 51

EP608CC		PAGE 1	
MATRIX PRICING - VOL. DISCOUNTS			
ACTION (I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST)~252			
KEY	CONTRACT SCHEDULE	20003	STANDARD DISC. 0.10
	PROD TYPE	CC	
	STUB LENGTH	11.0000	
	DOLLAR VALUE OR QTY (IN 1000'S)	20000.00	
ARGUMENT	DOLLAR/QTY INDICATOR	D (D OR Q)	
	WIDTH DISC.	WIDTH DISC.	
	8.500 10.00		
	9.875 10.00		
	10.625 10.00		
	12.000 10.00		
	14.875 10.00		
PF1=MENU PA1=FRWD PF2=RETURN PF5=PRIOR SCREEN~254			

FIG. 52

EP607CC	MATRIX PRICING - MAT'L UPCHARGES										PAGE 1
ACTION	(I=INQUIRE CURRENT, A=ADD, C=CHANGE, D=DELETE, L=LIST)~252										
KEY											
CONTRACT SCHEDULE	20003										PRICE FACTOR 1.000
PROD TYPE	CC										EFF. FACTOR 1.000
WEIGHT	18.0										
COLOR	VH										
GRADE	BOND										
IMAGE											
STUB LENGTH	11.000										
ARGUMENT											
WIDTH	STD	EXCP	PRC	EFF	WIDTH	STD	EXCP	PRC	EFF		
8.500	UPCHG	UPCHG	FCTR	FCTR	9.875	UPCHG	UPCHG	FCTR	FCTR		
10.625	4.04	4.04	.000	.000	12.000	4.59	4.59	.000	.000		
14.875	4.89	4.89	.000	.000		5.45	5.45	.000	.000		
	6.60	6.60	.000	.000							
PF1=MENU PA1=FRWD PF2=RETURN PF4=NEXT SCRN PF5=PRIOR SCRN PF6=ADD'L WIDTHS											

254

FIG. 53

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US96/01439

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : Please See Extra Sheet.

US CL : 364/479

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/479, 188, 146, 474, 22, 468, 401, 402, 403

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 5,357,439 (MATSUZAKI ET AL.) 19 OCTOBER 1994, SEE FIGURES 1-5, AND 28; COL. 6 LINES 13-COL. 8 LINE 5, COL. 8 LINES 27-45, AND COL. 2 LINES 26-34.	1-45

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	* T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A* document defining the general state of the art which is not considered to be part of particular relevance	* X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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* O* document referring to an oral disclosure, use, exhibition or other means		
* P* document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

29 APRIL 1996

Date of mailing of the international search report

21 MAY 1996

Name and mailing address of the ISA/US
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/01429

A. CLASSIFICATION OF SUBJECT MATTER:
IPC (6):

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09/343,547

30 June 1999 (30.06.99)

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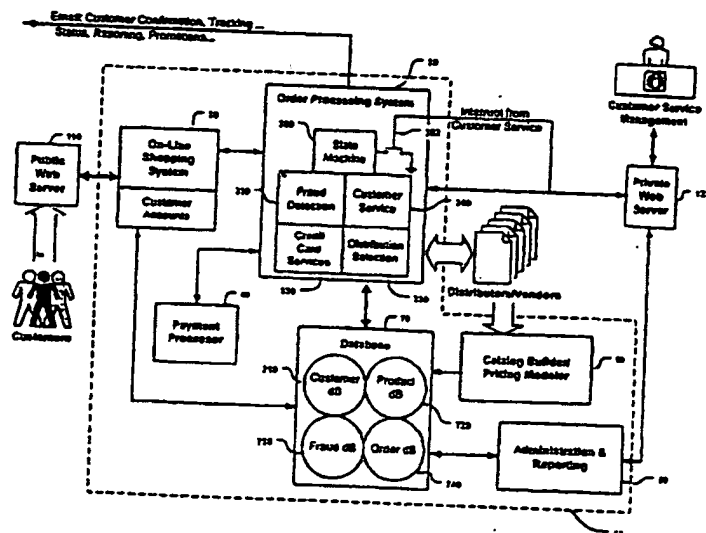
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(57) Abstract

An Internet business transaction processor of the present invention has a distributed processing architecture which allows the processing load to be distributed among multiple parallel servers. The transaction processor of the present invention provides a virtual store front utilizing "other people's warehouse" approach by using a dynamic distributor selection processing system to select among a plurality of distributors based on flexible rule-based algorithm. Furthermore, a multi-level fraud check processing system allows orders to be processed that would otherwise be discarded to generate a higher yield in sales.

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TITLE OF THE INVENTION

Dynamic Selection of Multiple Distributors

FIELD OF INVENTION

The present invention relates to business transactions conducted over the Internet and in particular to a transaction processor to conducting the same capable of performing dynamic selection of a distributor among a plurality of distributors based on dynamic selection criteria.

10. BACKGROUND OF THE INVENTION

Traditionally, commodities such as computer related products, for example, have been sold primarily through retail stores and catalogs and, more recently, through telephone sales supported by infomercials and other print and media advertising. However these traditional models for selling computer related products suffer significant disadvantages.

Store-based retailers have limited shelf space due to costly inventory and real estate investment considerations. This limits the number of products store-based retailers can offer to their customers. Also, the personnel required to operate stores are expensive and can be difficult to hire and train. The physical store's need for personnel also limits the flexibility and efficiency of the sales process. The number of customers that can be served and the quality of service is dependent on the number of personnel dedicated to the sales process.

Store-based retailers also face the financial risk of carrying inventory that may quickly become obsolete. Physical possession of inventory also limits the speed at which these retailers can change their merchandise mix and offer new products. This is because a store must

physically obtain, set up and display the products.

Physical stores also can only serve customers in a limited geographic area because the customers must travel to the store to shop. To extend this limited reach, new

5 stores must be opened in different geographic locations.

However, the time required and the significant investments in inventory, real estate and personnel required at each new location, make it difficult to expand quickly into new geographic regions.

10 Catalog-based (e.g., mail-order) retailing provides only a partial solution to the disadvantages of store-based retailing. Catalogs do provide customers with the convenience of shopping from home or the office at flexible times. However, catalog merchandising is costly
15 and wasteful because paper, printing, and postage are increasingly expensive and a large percentage of people to whom catalogs are sent will not use them. Also, the number of products catalogs can feature and the product information they can provide are limited due to catalog
20 mailing, printing and other related expenses.

Catalogs are also very inflexible and provide only limited accessibility. In order to change products or prices, the catalog must be reprinted and redistributed which is both costly and time consuming. Furthermore,
25 catalogs' accessibility is limited in that they are available only to those people to whom they are sent. Also, the catalog shopping experience is, in general, neither interactive nor personalized, yet requires extensive personnel support and manual intervention on
30 behalf of the retailer to take and process orders.

The more recent advent of the combination of infomercials and other advertising supporting telephone sales also provides only a partial solution. The ability

to order by phone provides the same inconvenience that the catalog does. However, infomercial and other advertising is extremely expensive. They are also limited in their geographic scope. Typical media outlets serve only a relatively small geographic area. To expand the geographic scope of advertising, additional media outlets in different locations must be used. This greatly increases expenses. Advertising is also limited in duration. Expense increases drastically upon extending the term of the advertising.

The advertisements and infomercials that describe the products are also limited in the scope of products they can cover. The expense limits the size of print advertising and the duration of radio and television advertising. These limitations restrict the number of products that can be covered. They also restrict the amount of information that can be provided for the products.

Recently, the Internet has emerged as a powerful new global communications and commerce medium that represents a radical new way for people to share information and conduct business electronically. Though the Internet has been well known for several years, it has been mainly used for research and as an educational medium. Hence people were initially slow to adopt it as a common means of conducting retail commerce. However, with technology advancing such that personal computers are now an affordable commodity for the average household, more and more personal computers are being acquired for home usage. In conjunction with increased computer awareness and usage, affordability and ease of accessibility to the Internet from an average household has given birth to a

new type of commercial medium referred to as Electronic Commerce (i.e., E-Commerce).

The increasing functionality, accessibility and overall usage of the Internet have made it an attractive commercial medium that can offer solutions to many of the shortcomings of the traditional retail models. For instance, the Internet has radically changed the relationship between customers. Online retailers can, from a single remote computer, interact directly and simultaneously with customers across the globe.

The Internet also eliminates the traditional retail models' limited availability and barriers to expansion. On the Internet, a store is accessible throughout the world around the clock. The limitations associated with printed catalogs are eliminated as well. There is no incremental cost associated with making Internet content available to people who will not use it. Internet also provides easy adaptability to changing market conditions and allowing an interactive, customizable retail experience.

Online retailers can respond more rapidly to customer demand by frequently modifying their product offerings, shopping interfaces and pricing, simply by modifying their Web site. Additionally, the Internet improves on the limited amount of information that can be conveyed in the catalog and advertising/telephone sales models of retail sales. Web sites are inexpensive relative to the number of potential customers they reach, allowing much more information can be provided on a Web site than in any advertisement.

However, even with the advantages that is associated with the usage of the Internet as a commercial medium, there are still drawbacks in the currently existing E-

Commerce retail businesses. In particular, most E-Commerce retail businesses mainly use the Internet and Web pages as an advertising medium to replace the previous catalog/infomercial type advertisements.

5 Although some of the businesses have begun accepting product orders online via email or Web pages, the current E-Commerce businesses for the most part have adopted a hybrid business model in which the traditional business models are coupled with E-Commerce business practices.

10 For instance, the usage of the Internet has replaced a few of the traditional business practices such as advertising and order processing, but most of the so-called E-Commerce retail businesses of the prior art still operate by maintaining an inventory. That is to
15 say, the current online businesses still maintain inventories in warehouses that store the merchandise to be sold. As described above, the costs associated with such business practices are high, especially in the computer related products market where their relatively
20 short life cycle and the rapid adoption of new technologies and products make the traditional inventory store and catalog sales models particularly problematic. If the computer products are not sold in a relatively short period of time, the unsold merchandise will become
25 obsolete due to the fast pace in which technology is evolving.

SUMMARY OF THE INVENTION

It is the object of the present invention to meet the above-identified needs and others. Specifically, the
30 present invention provides an Internet based E-Commerce business transaction processor that overcome the disadvantages of the prior art systems by creating a virtual store front having "other people's warehouse"

approach to avoid maintaining physical stores and operating warehouses while maintaining such practices transparent to the customer.

5 The business transaction processor of the present invention has a modular design comprising a plurality of distributed transaction processing systems, allowing the processing load to be distributed among multiple parallel servers thereby providing faster processing of transactions while providing expandability for future
10 growth.

The business transaction processor of the present invention interacts with multiple distributors thereby providing a larger selection of products with higher availability with aggressively competitive pricing all
15 the while maintaining gross company margins.

The business transaction processor of the present invention utilizes multi-level fraud checking system that incorporates propriety as well as commercially available fraud checking system thereby providing a higher level of
20 risk management while providing a fraud check system that is not exclusively dependent on commercially available services.

The business transaction processor of the present invention is fully automated including automatic
25 generation of an electronic catalog, competitive pricing engine based on flexible rule-based algorithms, and automatic feedback to the customer.

Additional objects, advantages and novel features of the invention will be set forth in the description which
30 follows or may be learned by those skilled in the art through reading these materials or practicing the invention. The objects and advantages of the invention

may be achieved through the means recited in the attached claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the present invention and are a part of the specification. Together with the following description, the drawings demonstrate and explain the principles of the present invention.

Figure 1 is a block diagram showing the overall system of the present invention.

Figure 2 is a state diagram of the order processing of the present invention.

Figure 3 is a flow diagram showing the fraud processing according to the present invention.

Figure 4 is a flow diagram showing the distributor selection processing according to the present invention.

Figure 5 is a block diagram showing the distributor selection logic according to the present invention.

Figure 6 is a flow diagram showing the distributor selection logic sequence according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Using the drawings, the preferred embodiments of the present invention will now be explained. As shown in Figure 1, the Internet business transaction processor 10 of the present invention has a distributed processing design allowing the processing load to be distributed among multiple parallel servers. The Internet business transaction processor according to the present invention is comprised of an Online Shopping System 20, Order Processing System 30, Payment Processing System 40, Catalog Builder/Price Modeler 50, and Administration System 60. The transaction processor 10 of the present invention also includes a main database 70 comprised of a

Customer Database 710, Products Database 720, Fraud Database 730, and Order Database 740.

According to the present invention, a customer accesses the Online Shopping System 20 via a public Web server 110 to obtain product information available for purchases, set up a customer account, check order status, etc. The Order Processing System 30 receives the product order requests and processes the orders to check for availability with multiple distributors, orders the products based on pricing information, performs credit card validations, etc. The Payment Processing System 40 processes the method of payment once the orders have been properly processed. The Catalog Builder/Price Modeler 50 builds information of the products offered by the distributors to be made available by the Online Shopping System 20 to the customer as well as the prices at which these products will be offered based on a pricing model to be described in detail below. Customer service representatives and managers have access to all of the information in the database via the Administration System 60 through a dedicated secure Web server 120 available only to authorized personnel. The Administration System 60 is used to produce reports of sales, reconcile order discrepancies, manually adjust prices, approve credit, etc. Functionality of each of the sub-systems will now be explained in detail.

Online Shopping System

The Online Shopping System 20 is the main interface between the customer and the E-Commerce business and is primarily responsible for providing the overall online shopping experience to the customer. The Online Shopping System 20 of the present invention provides an electronic catalog of available products stored in the Products

Database 720 along with the price of the product. This information is generated by the Catalog Builder/Price Modeler 50 to be described in detail below.

- 5 The electronic catalog is a Web page, for example, that dynamically displays product information from the Products Database 720. Consequently, the electronic catalog is always up to date with the most recent product information and does not suffer from the same shortcomings as that of the prior art cataloging systems.
- 10 Furthermore, because each product is displayed as a dynamic variable, a new catalog does not have to be generated every time the Product Database 70 is updated. Only the updated product information will be changed in the catalog.
- 15 In conjunction with the electronic catalog, the Online Shopping System 20 provides an electronic shopping cart that keeps record of each item marked to be purchased by the customer and provides a finalized shopping list and the total amount purchased at the end
- 20 of a shopping session which may include appropriate taxes and shipping/handling charges. The Online Shopping System 20 is also used to create customer accounts with such information as customer name, billing address, telephone number, email address, etc. and this
- 25 information is stored in the Customer Database 710. Such information is used by the transaction processor 10 for billing, order notification, promotional/incentive distribution, etc. A customer may also access the Online Shopping System 20 to track the status of previous orders
- 30 and returned merchandise, send inquiries to Customer Service, etc. Furthermore, customer accounts can be used to generate customized portfolios based on purchase patterns of individuals to provide targeted advertising,

purchase incentives such as electronic coupons and rebates, specialized promotions and competitive pricing of high demand products.

Catalog Builder/Price Modeler

5 As described generally above, the Catalog Builder/Price Modeler 50 builds the Products Database 720 with available products from the distributors as well as the sales price for each product. With regard to the catalog generation, the Catalog Builder/Price Modeler 50
10 receives product information from multiple distributors. The product information includes but are not limited to product description, quantity available, and price for the product.

15 Access to the product information from the distributors may be accomplished by Telnet, FTP (File Transfer Protocol), industry standard EDI (Electronic Data Interchange), or any other appropriate communication protocol including specialized client/server software provided by the distributors.

20 Downloading of the product information from the distributors is scheduled to run automatically by the Catalog Builder/Price Modeler 50 so that no human interaction is necessary unless it is desired to do so. The product information is preferably updated continually
25 throughout the day as updated product information becomes available from the distributors or based on other preselected triggers. For example, all the distributor data may be updated during certain times of the day. Data for some selected distributors may be updated hourly
30 while product data of others may be updated every time the web page is viewed for that product or after the product is ordered. As the communications technology becomes more advanced, it may be possible to maintain a

continuous connection to the distributors' network thereby obtaining real-time status of each product offered by the distributor.

For other suppliers of products that may not have such communication capabilities or does not make economic sense to provide such continuous update of product information, an alternative system may be provided for updating/accessing product information. For instance, small distributors or individual vendors may operate through a secure web site to update their product information, receive order information from the transaction processor of the present invention, and provide shipping/tracking information of their products from their companies.

Once the product information from each of the distributors is collected, the Catalog Builder/Price Modeler 50 sorts the product information to generate the electronic catalog. The Catalog Builder/Price Modeler 50 of the present invention generates multiple catalogs from the same system and allows the Online Shopping System 20 to dynamically display user specific interfaces. The Catalog Builder/Price Modeler 50 generates catalogs with different visual presentations (e.g., color, fonts, graphics, advertising, etc.) and product offerings depending on the user accessing the Online Shopping System 20 based on the user-specific information via criteria-specific templates.

For example, when a student accesses the Online Shopping System 20 of the present invention as a potential customer, the Online Shopping System 20 displays a catalog of mixed products appropriate for students with academic pricing. Alternatively, a business person who accesses the Online Shopping System

20 of the present invention may see a catalog of products appropriate for his or her business with available corporate discounts for that product. This way, a single system is maintained that looks and functions like many
5 different catalog shopping systems.

The pricing model used by the Catalog Builder/Price Modeler 50 of the present invention is an intelligent rule-based algorithm such as an AI (i.e., Artificial Intelligence) program generates a competitive price for a
10 product based on price of the product offered from the distributors, any specials that are being promoted for the product, and cost/profit margins from the sale of the product to the customer. Simply stated, the price of the product is a function of the profit margin. Default
15 margins are set in the rule-based programming of the pricing model, but due to its adaptability the Catalog Builder/Price Modeler 50 may automatically adjust the margins based on the rules of the pricing model and the pricing information obtained from the distributors.
20 Further, the rules of the pricing model and setting of margins may be manually modified using the Administration System 60 to be explained in detail below.

The Catalog Builder/Price Modeler 50 of the present invention uses a plurality of margins to determine the
25 sales price of a product depending on which category the product is in. For instance, the margin for the products in the first category may be set to 10% + cost since this is a category of products that the customer would most likely buy even though the price may be a little bit
30 high. On the other hand, the margin for the products in the second category may be set to 2.5% + cost in order to provide a competitive price for high demand products. Further, the margin for the products in the third

category may be set to 0% + cost due to promotionals of discontinued products, for example.

The Catalog Builder/Price Modeler 50 may be used to obtain initial sale prices of the products to be listed in the electronic catalog. Furthermore, the Catalog Builder/Price Modeler 50 may also adjust the pricing dynamically based on other system data that may change throughout the day. For example, the price may be adjusted based on the amount of web site traffic, sales for a particular vendor, category, or SKU, and even the time of day. Subsequently, the Catalog Builder/Price Modeler 50 may be used in conjunction with the Order Processing System 30 to be described in detail hereinafter to select a distributor to fill the order for a selected product using real-time data at the time of purchase. In this way, prices of the products in the electronic catalog can be dynamically changed based on the current market for these products.

Order Processing System

The Order Processing System 30 of the present invention processes the orders passed from the Online Shopping System 20. The Order Processing System 30 of the present invention is comprised of four basic sub-systems: Fraud Detection 310, Credit Card Services 320, Distributor Selection 330, and Customer Service 340. The overall functionality of the Order Processing System 30 is described hereinafter.

When an order for a selected product is received, the Order Processing System 30 first determines whether the order is a valid order by the Fraud Detection sub-system 310. If the order is valid, then the order is sent to the Distributor Selection sub-system 330 to determine firstly if the product ordered is available and

secondly from which distributor the product will be supplied. Once a distributor is chosen the order is fulfilled with the distributor. After confirmation of product shipment, the order is sent to the Payment

5 Processing System 40 via the Credit Card Services sub-system 320 to charge the customer's credit card for the purchase. The Customer Service sub-system 340 monitors each of the ordering processes and can intervene anywhere in the process if warranted.

10 Moreover, the Order Processing System 30 of the present invention is driven as a state machine 300. As such, a purchase order during processing enters predetermined states as shown in Figure 2. Interrupt switch 302 is operable to interrupt state machine 300 to
15 facilitate selective tracking of an order during processing to determine the status of any purchase order during processing. The intervention of the state machine 300 also allows the ability to force an order into a particular state or manually set certain flags by hand.
20 As such, the state machine 300 of the present invention allows enhancements to the state diagram for manageable changes to the Order Processing System 30. Additions or deletions of new states, arcs, and conditions change the paths an order takes through the order processing
25 operation. As will be hereinafter more fully explained, a purchase order during processing under control of state machine 300 can only come to rest at a predetermined number of processing stations or states (e.g., H, M, N, O, X, etc.) as shown in Figure 2.

30 Each block represents a state in which a purchase order being processed by the Order Processing System 30 can occupy. According to the present invention, a purchase order being processed by the Order Processing

System 30 must move from one state to the other except in the states indicated in bold, e.g., states (H), (M), (N), (O), (X), and (W). These are the only states according to the present invention in which a purchase order can be at rest at a final destination. All other states are transient and the order will eventually move to the next state, or eventually flagged with an error condition which triggers an alarm to customer service indicating an abnormality in the order processing. For example, an order that has been placed for a product in stock but never shows up as being shipped (i.e., stuck in the "in-stock" state) times out after a predetermined time period and is flagged as an error.

With the Order Processing System 30 of the present invention functioning as a state machine as described above, a purchase order can only be in predetermined states at any given time thereby facilitating ease of tracking of the status of an order.

A detailed description of each of the sub-systems is provided hereinafter.

Multi-Level Fraud Detection

The Fraud Detection sub-system 310 of the present invention is a multi-level fraud checking system used to determine if an order is a valid order. As shown in Figure 1, when an order is passed from the Online Shopping System 20, the Order Processing System 30 receives the order information such as credit card information, billing address, shipping address, quantity of selected products, sales prices of the products, etc. This order information is initially passed through the Fraud Detection sub-system 310.

The Fraud Detection sub-system 310 initially performs a data integrity check on the order information

for completeness such as billing address information, shipping address information, and method of payment. For credit card purchases, the credit card information is checked to verify that the credit card is not yet
5 expired. If the data integrity check fails on the order, the customer is notified of the incomplete portions of the order for correction. Once the order passes the data integrity check, the order then proceeds to a gross fraud check.

10 Gross fraud check involves searching the Fraud Database 730 internal to the transaction processor 10 of the present invention for history of bad credit by the customer submitting the order. The gross fraud check of the present invention acts as an initial filter for
15 rejecting obvious fraudulent orders such as orders from "black-listed" customers in the Fraud Database 730 with previous histories of bad credit, orders from countries other than the United States under economic crisis, etc. If an order fails the gross fraud check, the order is
20 passed to Customer Service 340 and the customer is immediately notified of the reasons why the order cannot be processed. If, on the other hand, the order passes the gross fraud check, the order is then checked for credit card authorization from a financial institution,
25 such as a commercially available fraud check service.

Based on the information received from the financial institution, a fraud level score, for example, is generated. The fraud level score is a grading system that indicates the level of risk the order will pose to
30 the business by processing the order. The score is then compared with a predetermined threshold or a plurality of thresholds. Each threshold serves as a trigger to invoke other fraud rule based checks to be performed in

conjunction with the score to determine the total status of the failed orders. This allows the failed order to be characterized by several types of failures given a total overall score. If the order passes the fraud checks, it is sent for finalized order processing. If, however, the order does not pass muster under the fraud checks, it is sent into a sorting bin. The sorting bin of the present invention acts as a buffer to minimize discarded orders. According to the present invention, a dynamic sorting procedure is performed on the rejected orders stored in the sorting bin.

The failed orders in the sorting bin are analyzed for reasons why the fraud level score was so high. Failed orders are analyzed for previous purchases by the customer, whether the customer is an account holder, etc. and sorted between high risk and low risk orders. For instance, orders from repeat customers who otherwise have a good history of previous purchases, for example, are low risk orders even though the fraud score is high and orders from customers who have no previous purchase history pose a high risk on defaulting on payments. Subsequently, the sorted orders are either sent to Customer Service 340 to be altered and resubmitted for validation or stored in a list of bad names in the Fraud Database 730 to be used in the gross fraud check of subsequent orders.

Alternatively, if there are generally a high number of failed orders in the sorting bin preventing sales of products, the fraud scores are analyzed and the threshold is dynamically modified to reduce the number of orders being rejected by the Order Processing system 30. By incorporating multi-level fraud checking system in the manner of the present invention, orders that would

otherwise be lost can be recovered thereby increasing business transactions.

Distributor Selection

Once an order has been checked for fraud and passes as a valid order, the products in the order are checked by the Distributor Selection sub-system 330 to determine which distributor will be used to fill the order. The selection of a distributor may be determined by several different methods.

Preferably, as shown in Figure 4, when an order is received by the Distributor Selection sub-system 330, the product information such as the product SKU (i.e., Stock-Keeping Unit) number and quantity is determined from the order and sent to the data input 331. This information is then sent to each of the distributors and the distributors are polled for availability, quantity available by the distributor, and the current price for the product, for example. The information received from each of the distributors are then used by the distributor selection logic 332 to determine which distributor will fill the order. When more than one distributor can fill the order, the product information from each of the available distributors is processed by the distribution logic 332 based on the rule-based algorithm similar to the Catalog Builder/Price Modeler 50 to determine which distributor will be able to best fill the order.

Figures 5 and 6 show an example of the logic blocks that make up the distributor selection logic and the logic sequence, respectively. The sequence of the logic as shown in Figures 5 and 6 are for illustrative purposes only. It would be within the scope of one with ordinary skill in the art to vary the logic order to thereby vary the priority of the selection criteria used in selecting

the desired distributor. The product information from the authorized order is input into the product data input 331. The ordered product is then compared in the inventory comparator 333 to determine which of the distributors have the ordered product in stock. If none of the distributors have the product in stock, the customer is advised of the back order of the product. The result of the inventory check is then sent to the price comparator 334. If only one distributor has the ordered product in stock, then the result is cascaded down until the selected distributor data 337 is submitted to the Order Processing System 30 to finish processing the order.

If more than one distributor has the ordered product in stock, the result is compared in the price comparator 334 based on a predetermined rule, such as to choose the distributor offering the lowest price. Again, if the result of the comparison returns only one distributor, then the result is cascaded down and the selected distributor data 337 is used by the Order Processing System 30 to finish processing the order. If more than one distributor has the same price, then the result is sent to the user defined rule-based logic section 336.

User defined rule-based logic section 336 uses user defined rules and algorithms to further narrow the choice of distributors to fill the order. For instance, selective rules and algorithms may be set to choose a distributor that would return the maximum amount of profit margin for the sale of the ordered product. This may include factors other than cost, such as free or different priced shipping charges from each distributor. It may be that one distributor charges a handling fee on orders less than \$500, for example, while another may

charge a flat fee regardless of the size of the order. Alternatively, the rules in the user-defined rule-based selection logic 336 may be set such that, for example, a distributor with a special contracting agreement is
5 selected regardless of profit margin comparison results.

Once a distributor has been selected, the result is used by the Order Processing System 30 to finish the order processing such as authorizing the selected distributor to ship the product and to notify the
10 customer of the shipping information, for example. In addition, as indicated in Figures 5 and 6, each of the comparators have a manual input line for receiving modifications to the rules and algorithms used in making the comparison. According to the present invention,
15 customer service 340 may modify and/or override each of the parameters used in performing the distributor selection.

Alternatively, if the connection between some or all of the distributors cannot be established during an
20 ordering processes, the product information stored in the Product Database 720 may be used instead of delaying the processing of the orders. As explained above, the products information is updated preferably continually throughout a business day. Therefore, even if a
25 connection cannot be made at the time of the order, the product information is accurate enough to fill the order.

Once a distributor selection is made, the Distribution Selection sub-system 330 forwards the order electronically to the selected distributor to fill the
30 order. The Distributor Selection sub-system 330 then receives verification from the distributor such as customer number, warehouse information, shipment date, invoice amount, shipping cost, tracking number, etc. and

stores the order information in the Order Database 740 to make it immediately available to the customer service and the customer's online account.

Credit Card Services

5 Credit Card Services sub-system 320 receives the orders forwarded to the distributor by the Distributor Selection sub-system 330 and forwards the total cost of the order to the Payment Processing System 40 to be charged to the customer's credit card. Alternatively, if
10 a product has been returned, the Credit Card Services sub-system 320 processes the RMA (i.e., Returned Merchandise Authorization) and sends the request to the Payment Processing System 40 to refund the amount to the customer.

15 Customer Service

Customer Service sub-system 340 provides a feedback interface between the E-Commerce business using the transaction processor 10 of the present invention with the customers. Customer Service sub-system 340 allows
20 the customer service representatives to access any part of the order processing being performed by the Order Processing System. Customer Service 340 provides the interface into the Order Processing System 30 by handling failed orders, sorted orders from failed orders, customer
25 inquires to order/RMA status, and other customer service issues:

In particular, Customer Service sub-system 340 provides automated feedback to the customer. For instance, once an order has been properly processed, the
30 Customer Service sub-system 340 will send an automated message to the customer with the order information such as customer number, shipment number, tracking number, etc. In cases where orders have failed during the

processing period, Customer Service sub-system 340 automatically generates notices to the customer and/or customer service relaying that the order has failed and provides further instructions on how to correct the problem. Additionally, Customer Service sub-system 340 may be programmed to send customers in the Customer Database 710 periodic newsletters, promotional offers, exclusive sales, coupons and incentive, etc. Moreover, this periodic feedback to the customer can be highly personalized based on the information stored in the Customer Database 710 such as the customer's buying patterns.

Payment Processing System

The Payment Processing System 40 receives order/RMA information from the Order Processing System 30 in conjunction with the payment method information. For credit card orders, the Payment Processing System 40 contacts the financial institution issuing the credit card and charges the account holder for purchases or credit the account for processed RMAs. For non-credit card orders, the Payment Processing System 40 may issue bills, receive CODs (i.e., cash-on-delivery) and checks, issue refunds, process wire-transfers, etc. Moreover, the present invention may also take advantage of online leases and loans, a relatively new service in the area of e-commerce.

With respect to the online loans, once a customer is finished shopping with the Online Shopping System 20 of the present invention, the customer applies electronically to a financial institution for a loan. When the loan has been approved, the financial institution sends a loan number and the loan balance limit to the Order Processing System 30. The Payment

Processor 40 then proceeds to use the loan number as a credit card number and finishes the transaction by drawing on the approved loan from the financial institution.

5 With regard to the online lease, once a customer is finished shopping, the customer applies for a lease from a financial institution. When the application is approved, the financial institution sends a lease number to the Order Processing System 30. The Payment Processor
10 40 then proceeds to use the lease number as a credit card number and finishes the transaction drawing on the approved balance from the leasing institution. The purchase is then shipped directly to the customer, but as with all leases, the leasing institution owns the
15 products.

Example of Ordering Online

The transaction processor 10 of the present invention will be described with specific embodiments to more clearly describe the functionality of the present
20 invention. However, equivalent components and obvious modifications within the ability of one with ordinary skill in the art may be used without departing from the scope of the present invention.

The transaction processor 10 of the present
25 invention is built on industry standard equipment including Sun UltraSparc servers, Solaris operating system, Apache Web servers, and Oracle databases. Preferably, each of the systems and sub-systems are installed on a dedicated server running in parallel in a
30 distributed processing architecture.

A customer accesses the Online Shopping System 20 via the company's Web page through a public Web server 110, such as the customer's ISP (i.e., Internet Service

Provider). Once on the company's Web page, the customer is issued a unique identification number using various techniques such as using the customer's IP (i.e., Internet Protocol) address, IP host name, personal information, etc. so that others accessing the Online Shopping System 20 do not share each others' shopping information. The customer then browses/searches the Web site (i.e., electronic catalog) for a particular product. The customer selects the product or products and the Online Shopping System 20 places the selected products in an electronic shopping cart.

At the time of checkout, the customer is asked to create a customer account asking for personal information such as name, billing address, telephone number, email address, as well as some profile information (all of which may be optional) to generate a customer account. If the customer already has an account, then the account ID is used to identify the customer and the customer is prompted for their password.

Once a customer account has been established, the order is filled out for the products to be purchased including quantity, method of payment (the credit card number may be established in the customer account so that it does not have to be inputted every time), shipping address, and method of shipment. When the order is completed, the order is passed onto the Order Processing system 30.

The Fraud Detection sub-system 310 performs a data integrity check such as whether each of the required fields of the order form are filled out, checksum test of the credit card number, etc. If the order fails the integrity check, the customer is prompted with an error message requiring to resubmit the order with the

corrections. If the order passes the integrity check, then the order undergoes the gross fraud check.

The gross fraud check determines whether the customer has a history of defaulting on payments, whether the credit card number is a valid number, or is ordering from a "black-listed" location such as Romania or Russia. If the order fails the gross fraud check, the order is sent into a sorting bin. If the order passes the gross fraud check, the order is sent to a commercially available fraud checking service such as CyberSource®. CyberSource® processes the order information and returns a fraud score. The fraud score is then compared to a plurality of predetermined threshold that may be modified by customer service 340 and used in conjunction with other fraud rule based checks. If the order fails, it is placed into the sorting bin. If the order passes, it is sent to the Distributor Selection sub-system 330 for further processing.

As for the orders in the sort bin, the failed orders are sorted between high risk and low risk orders such as whether the order was from an account holder who has good credit history from past purchases, whether the fraud score was too high because the billing address did not match the address of the credit card, etc. The plausible orders are then forwarded to the Customer Service sub-system 340 from which the Customer service representatives either contact the customer to clarify the discrepancies or override the fraud checks and place them into the processing bin to be sent to the Distributor Selection sub-system 330 for further processing. The rest of the failed orders are placed in the Fraud Database 730.

The Distributor Selection sub-system 330 sends the product information (i.e., SKU and quantity) to each of the distributors such as independent pick, pack, and ship distributors and receives information on the products such as availability and cost. The Distributor Selection sub-system 330 forwards this information to the Catalog Builder/Price Modeler 50 and profit margins are calculated. The Distributor Selection sub-system 330 then selects the distributor with, for example, the highest margin or other selected criteria for particular products and forwards the order electronically. Once the distributor fills the order, the Customer Service sub-system 340 either receives or retrieves the order information such as the customer number, warehouse number, shipment date, shipment tracking information, invoice amounts, etc.

Customer Service sub-system 340 emails the customer within minutes after a valid order is received with a confirmation number. The Customer Service sub-system 340 emails the customer again when the order is shipped by the distributor or notifies the customer that the product is not available and has been placed on back order.

The preceding description has been presented only to illustrate and describe the invention. It is not intended to be exhaustive or to limit the invention to any precise form disclosed. Many modifications and variations are possible in light of the above teaching.

The preferred embodiment was chosen and described in order to best explain the principles of the invention and its practical application. The preceding description is intended to enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use

contemplated. It is intended that the scope of the invention be defined by the following claims.

What is claimed is:

1. An improved internet-centric transaction processor for authorizing and facilitating retail sale of ones of a plurality of selected products to retail
5 customers directly from a plurality of distributors of said products comprising:
 - a database for storing catalog-type product data for a plurality of selected products;
 - a communication interface for selectively
10 permitting ones of said retail customers to selectively access said product data stored on said database;
 - an electronic order form for permitting said retail customers to place a purchase order for ones of said selected products;
 - 15 an order processor for processing purchase orders for ones of said selected products, said order processor further including
 - a distribution selection processor for
20 dynamically allocating a particular product order to one of said plurality of distributors which handle a particular product involved in said purchase order based upon predetermined selection criteria and authorizing a selected distributor to ship said ordered product to said retail customer; and
 - 25 a payment processor for billing said retail customer for said ordered product authorized for shipment.
2. The improved transaction processor of claim 1,
said distribution selection processor further includes
30 a comparator for comparing like types of product data for a plurality of distributors handling said like product to determine an optimum distributor selection based upon a plurality of selection criteria

including product price, availability, shipping date, shipping location or discount data.

3. The improved transaction processor of claim 1 further including means for modifying ones of said
5 predetermined selection criteria.

4. An improved internet-centric electronic transaction method executable by a computer for facilitating retail sales of ones of a plurality of selected products to retail customers directly from a
10 plurality of distributors of said products comprising the steps of:

generating catalog-type product data for said products in a selectively addressable database,

15 permitting ones of said retail customers to selectively access said product data stored in said database and allowing said retail customers to submit product orders of said selected products;

20 processing said purchase orders from ones of said retail customers by selecting one of said plurality of distributors to sell said selected product based upon a plurality of predetermined distributor product selection criteria;

25 authorizing said selected distributor to ship said ordered product to a retail customer in a manner which is transparent to said retail customer;

authorizing said purchase orders based upon a credit worthiness check of information supplied by said retail customer in connection with said purchase order; and

30 billing said retail customer for said ordered product when said distributor has been authorized to ship such ordered product to said retail customer.

5. The improved internet-centric electronic transaction method of claim 4 further including the step of periodically modifying ones of said predetermined selection criteria.

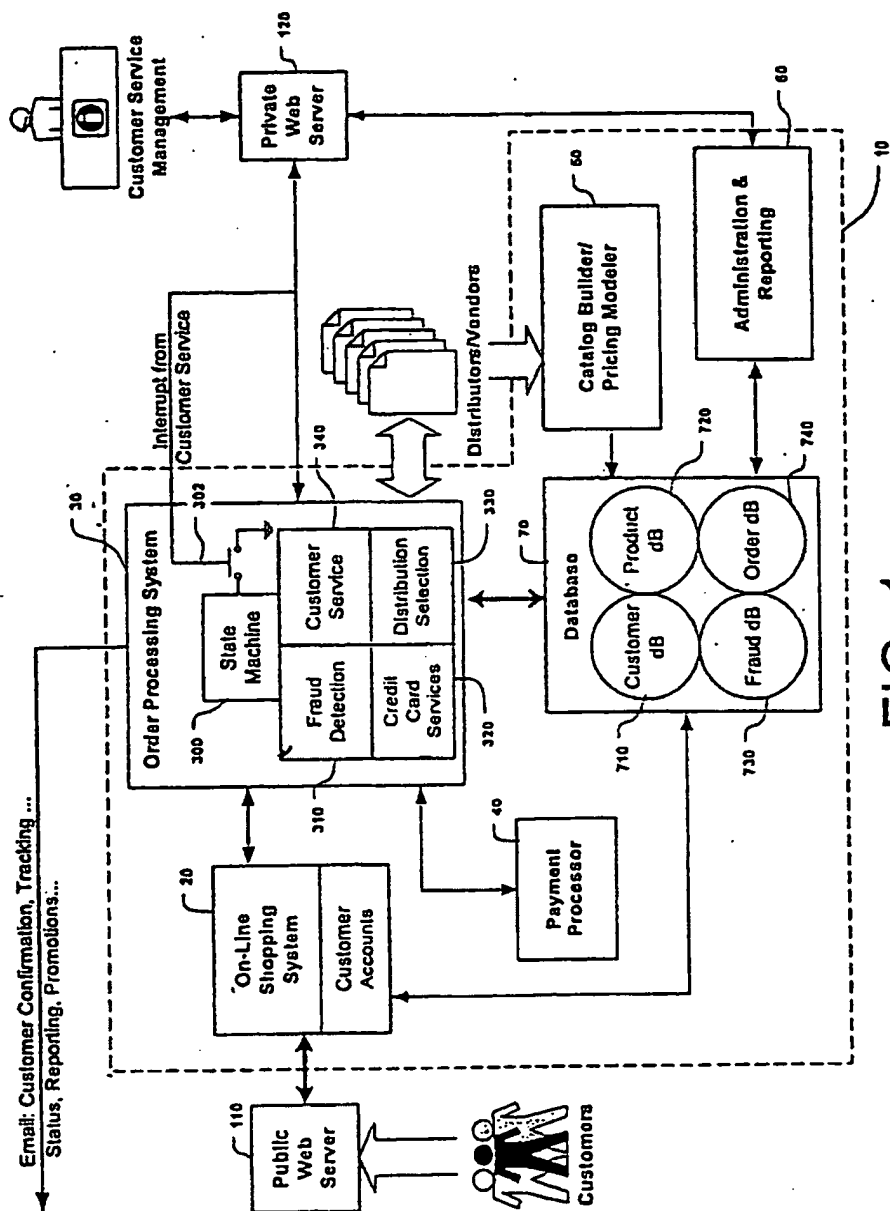


FIG. 1

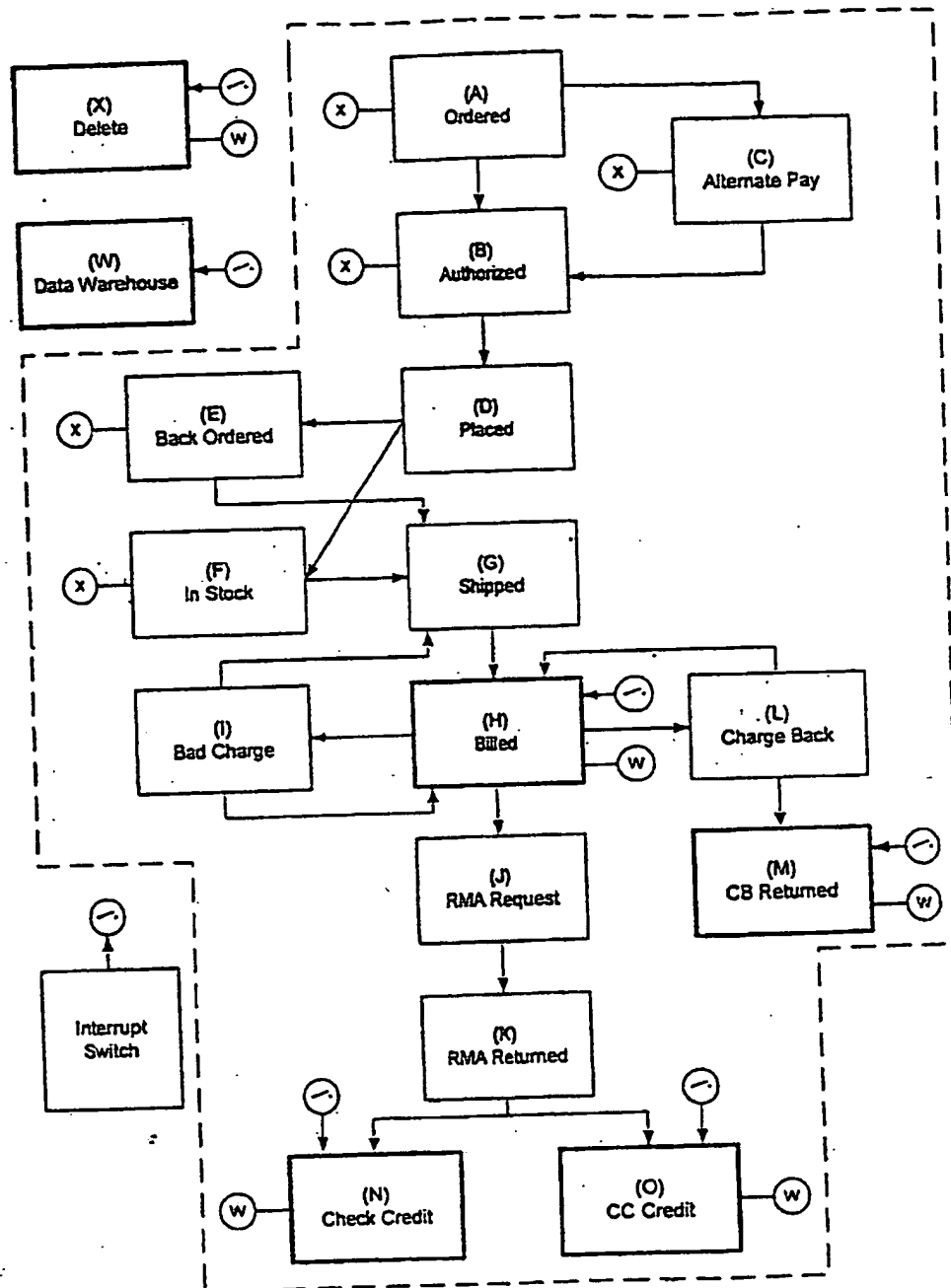


FIG. 2

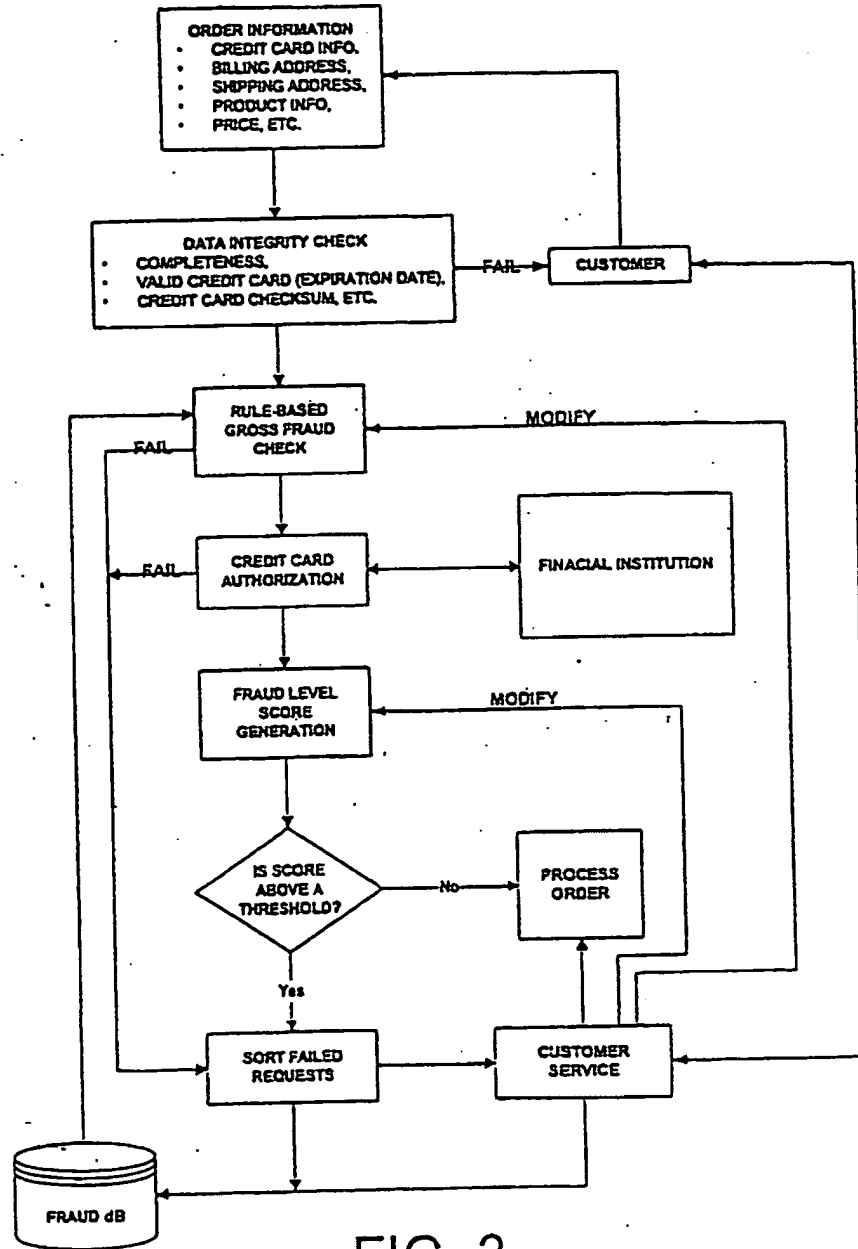


FIG. 3

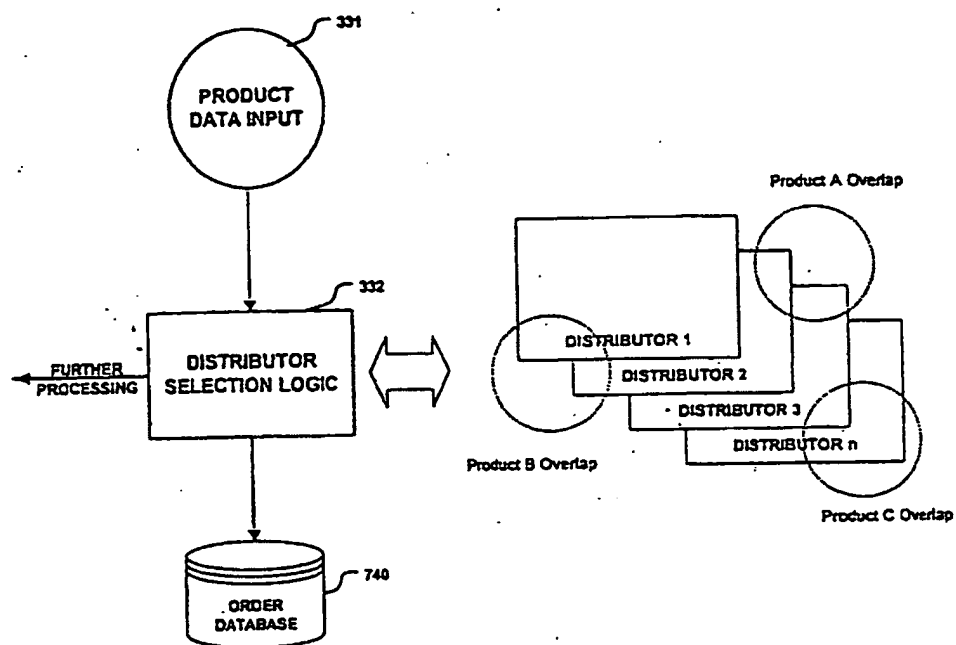


FIG. 4

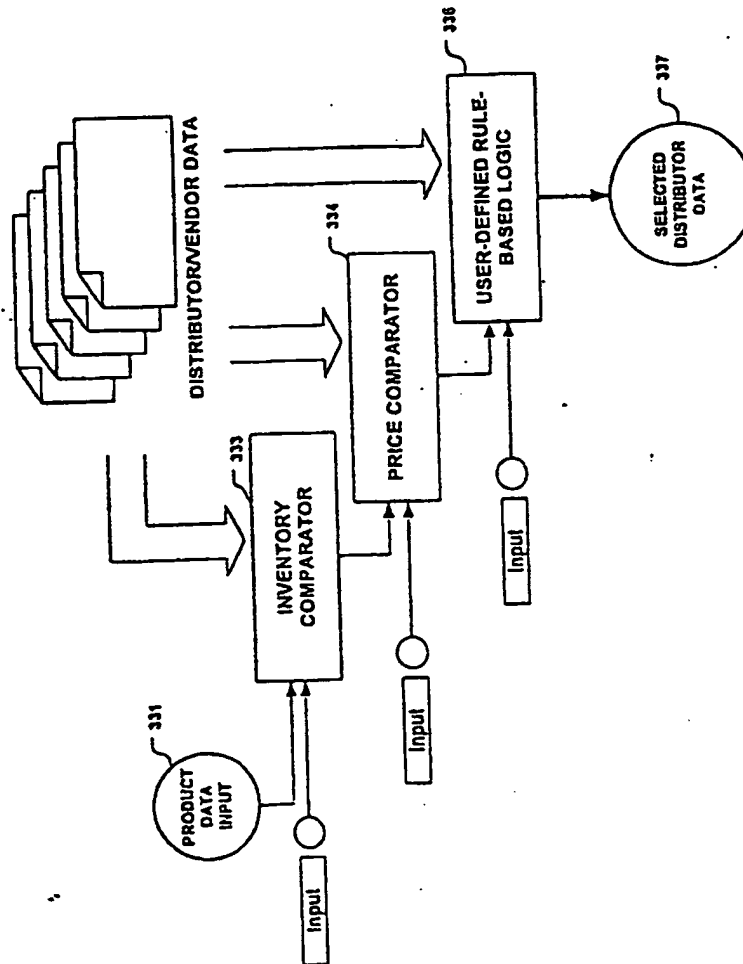


FIG. 5

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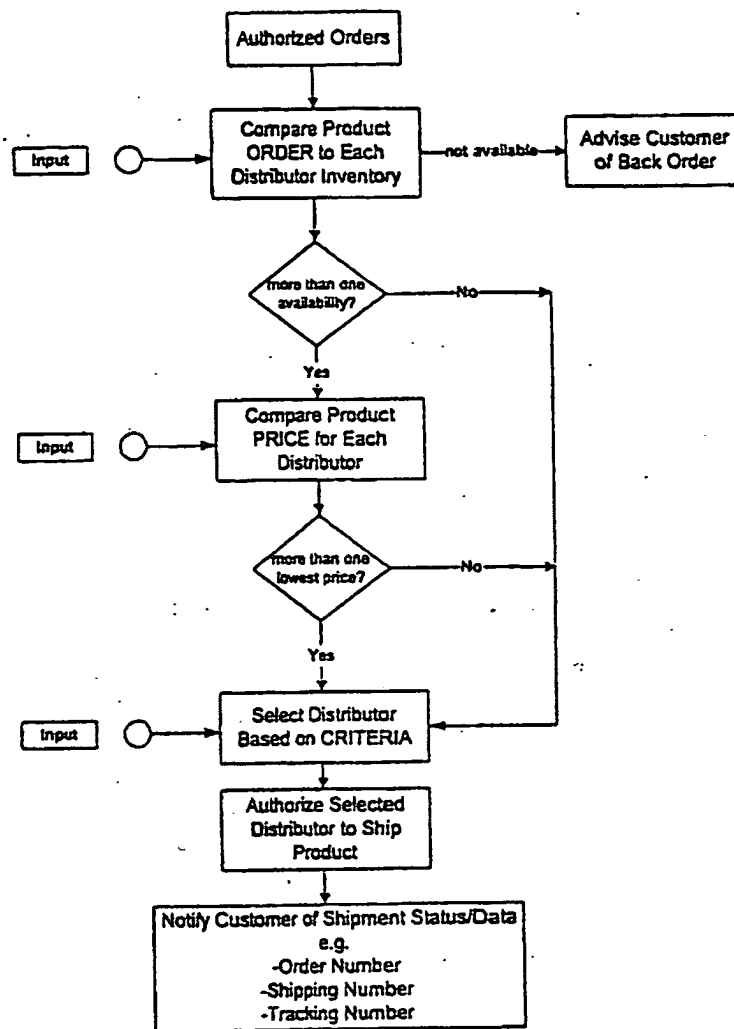


FIG. 6

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/24453

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 742 931 A (KRAETZ JOSEPH ET AL) 21 April 1998 (1998-04-21) abstract; figure 1 claims 1,2,4 column 1, line 22 - line 59 column 2, line 19 -column 3, line 17	1,4
A	US 4 992 940 A (DWORKIN ROSS E) 12 February 1991 (1991-02-12) abstract; figure 1 column 1, line 13 - line 60 column 2, line 49 -column 3, line 14 claim 1	1,4
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

20 March 2000

Date of mailing of the international search report

27/03/2000

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5 799 284 A (BOURQUIN ROY E) 25 August 1998 (1998-08-25) abstract column 2, line 40 -column 3, line 7	1,4
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E	US 6 016 504 A (DOBSON JENNIFER L ET AL) 18 January 2000 (2000-01-18) abstract; figure 1 column 4, line 1 - line 32 column 5, line 24 - line 62 column 8, line 9 - line 44 claim 1	1,4

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 99/24453

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US 4992940 A	12-02-1991	NONE	
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